



**Palestine**  
Few signs yet of  
fruits of peace  
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Office Technology  
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# FINANCIAL TIMES

Europe's Business Newspaper

WEDNESDAY OCTOBER 26 1994

D8523A

## Arctic threatened by oil spillage in northern Russia

A burning oil slick spilling out from a pipeline in the northern Russian province of Komi is threatening to create an environmental disaster in the fragile Arctic. Komi officials asked Moscow for help in dealing with the spill yesterday, after the New York Times had already reported the leakage and said that it amounted to only 100,000 barrels.

Page 16

**UK pensions inquiry:** UK life insurers face the prospect of compensating perhaps hundreds of thousands of investors, after a regulator's inquiry suggested that the scale of poor advice in selling personal pensions was far greater than expected. Page 16 and Lex: Most life houses welcome SIB plan, Page 8; Editorial Comment, Page 15

**Mini-electronics breakthrough:** Researchers have made a breakthrough in electronic miniaturisation that could lead to computer memories and microprocessors one five-hundredth the size and 500 times faster than today's silicon chips. Page 16

**Eastman Kodak,** the photographic manufacturer, reported a further decline in operating profit in the third quarter and said restructuring might be necessary. Page 17

**Tenneco,** the diversified US industrial company, is expected to announce today that it will buy Gillet, a German automotive components manufacturer, for cash and assumed debt in a deal valued at \$1.1bn. Page 17

**Protests on eve of Israel-Jordan accord:**

A member of Jordan's parliament addresses protesters in the centre of Amman as part of a campaign to undermine the country's peace accord with Israel, due to be signed today. The rally, attended by several thousand supporters of the powerful Muslim Brotherhood in the Hashimiyah square, was organised secretly as the Jordanian authorities had banned protests. Jordan needs help to ease debt burden, Page 4

**Sri Lankan victim's widow to stand:** The widow of assassinated Sri Lankan opposition leader Gamini Dassanayake was picked by the United National party to run in presidential elections in two weeks' time. Page 4

**Steel industry risks crisis:** Europe's steel industry risks another crisis because of its failure to deliver crucial capacity cuts, warned Mr Karel Van Miert, European competition commissioner. Page 2; Lex, Page 15

**Report hails German recovery:** The German government claimed its policies had been vindicated by a report from the country's six leading economic institutes predicting that the economy would grow by 2.5 per cent this year and by a further 3 per cent next year. Page 2

**UK and France ties closer:** The UK and France are edging towards closer co-operation, particularly in defence and security, in spite of the two countries' history of ill-tempered spats and sharply contrasting rhetoric over Europe. Page 3

**Auto electronics market set to double:** The automotive electronics market is forecast to double to \$80bn a year between 1993 and 2000. Page 4

**Japanese index hits seven-year high:** Japan's index of current business conditions hit a seven-year high in August, suggesting the recovery may be becoming more broadly based. Page 4

**EU credit rules risks extra red tape:** Brussels' plans to harmonise export credit within the European Union risk imposing extra delay and red tape on European exporters just when they face fiercer competition from the US, the leading French credit agency warned. Page 7

**Canadian trade mission to China:** The rivalry among industrial countries to promote commercial ties with China will reach a new pitch next month when Mr Jean Chretien, Canada's prime minister, leads a mission of almost 400 business leaders, politicians and officials to Beijing. Page 7

**Eurostar delayed against:** The Eurostar Channel tunnel rail network suffered its second delay on a trip arranged for invited guests to sample its service to the Continent. Page 9

**Row over unleaded petrol:** UK legislators and the oil industry are arguing over whether unleaded petrol poses a risk of a threat to health than the leaded petrol it set out to replace. Page 9

STOCK MARKET INDICES			
FT-SE 100	2000.9	(-28.2)	
Yield	4.23		
FT-SE Eurotrack 100	1298.9	(-16.32)	
FT-SE-A All-Share	1487.24	(-0.99)	
Nikkei	19,732.15	(-120.22)	
New York: last close			
Dow Jones Ind Ave	3948.91	(-6.38)	
S&P Composite	468.70	(-0.13)	
US LUNTIME RATES			
Federal Funds	4.25%		
3-mo T-bill	5.17%		
Long Bond	5.5%		
Yield	8.05%		
LONDON MONEY			
3-mo Interbank	5%	(5.5%)	
12-mo gk rate	5.5%	(5.5%)	
Brent 15-day (Dec)	16.04	(16.32)	
Oil			
New York Crude (Dec)	\$301.2	(\$31.4)	
London	\$288.4	(\$38.5)	
Tokyo close Y 98.75			
Australia	\$0.62		
Belgium	\$1.25		
Denmark	\$1.00		
France	\$1.10		
Germany	\$1.00		
Greece	\$1.00		
Hong Kong	\$1.00		
India	\$1.00		
Italy	\$1.00		
Japan	\$1.00		
Malaysia	\$1.00		
Netherlands	\$1.00		
New Zealand	\$1.00		
Norway	\$1.00		
Portugal	\$1.00		
Spain	\$1.00		
Sweden	\$1.00		
Switzerland	\$1.00		
Taiwan	\$1.00		
Thailand	\$1.00		
UK	\$1.00		
USA	\$1.00		
Yugoslavia	\$1.00		

## US currency and bond weakness blamed on Fed ■ European stocks suffer setbacks

# Markets fall as dollar hits new lows

By Philip Coggan  
and Philip Gawth

The US dollar slipped to fresh lows against the D-Mark and the yen yesterday, while European bond and equity markets fell in the wake of Monday's rise in the US Treasury long bond yield above 8 per cent.

The US currency touched a post-second world war low of DM1.4845, before recovering to close in London at 1.4868 and DM1.487.

Mr Lloyd Bentsen, the US Treasury secretary, whose reported comments last week hurt dollar sentiment by apparently ruling out intervention to support the US currency, yesterday said: "We

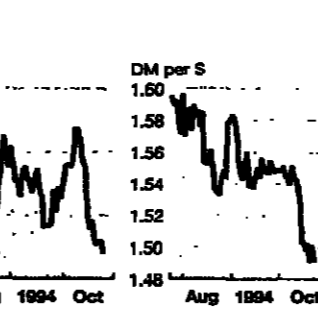
would like a stronger dollar." Traders have blamed the recent weakness in the dollar and the US Treasury bond market on the belief that the US Federal Reserve was acting too slowly to combat inflation. Mr Malcolm Barr, international economist at Chemical Bank in London, said: "Sentiment towards the dollar remains pretty unanimously negative."

But Mr Alan Blinder, the Fed deputy chairman, said he did not believe the Fed was "behind the curve" in fighting inflation. "I think we're very close to riding the curve," he said, implying that the Fed's actions were up with events.

However, Mr Blinder added that the economy was "showing

fewer signs of deceleration than I would have thought several months ago."

Financial markets gained a small amount of relief yesterday from figures on US consumer confidence and employment costs, which appeared to show subdued inflationary pressures. Nevertheless, European markets reacted negatively to the rise in the US long bond yield,



with the 8 per cent level seen as a watershed for the markets. "Previously 8 per cent was seen as fair value for Treasury bonds," said Mr Michael Hughes, global strategist at UK securities house BZW. "But there is a growing concern that markets are headed for an overshoot." UK investment bank Kleinwort Benson is predicting that the long bond yield will rise to 8.5 per cent.

German government bonds and UK gilts dropped about three quarters of a point and bond fed through to shares.

In London, the FT-SE 100 index closed 26.2 points down at 3,000.9, having at one point fallen 43.5 points to 2,956.8. A weak US dollar also hurts European shares by damaging prospects for export-led growth and reducing the local currency value of the earnings of US subsidiaries of European companies.

In Frankfurt, the DAX index closed 1.3 per cent lower in after-hours trading yesterday while in Paris, the CAC-40 index closed just under 1 per cent down.

In New York, the 30-year Treasury bond had slipped a further sixth of a point by 2.30pm and was yielding 8.06 per cent, while the Dow Jones Industrial Average was 21.3 points lower at 3,834.10.

Consumer confidence, Page 6  
Bond yields, Page 17  
World Stocks, Back Page, Sect II  
Currencies, Page 34  
International Bonds, Page 24

## Insurer restricts business with Saudi Arabia

By Roger Matthews,  
Middle East Editor

Short-term export credit insurance for companies doing business in Saudi Arabia is being restricted by a leading international insurer.

NCM Credit Insurance, the Dutch-controlled company which provides 80 per cent of short-term export credit cover in the UK, told customers it was taking the step because of the kingdom's "very grave" financial situation and payments delays.

Meanwhile, Mr Lloyd Bentsen, the US Treasury secretary, said yesterday that Saudi Arabia was facing some "credit problems", but added that the kingdom did not have any serious financial difficulties.

Mr Bentsen, who visited Saudi Arabia earlier this month, said that the government was taking steps to bring down the budget deficit.

NCM Credit Insurance told UK customers it was cancelling open account credit limit approvals and would only restate them if strict criteria were met. This means that cover to regular exporters will no longer be automatically available.

The company added: "We recognise the seriousness of these measures and their likely impact on the business of many of our customers."

"However, the situation in Saudi is very grave and continues to deteriorate. It is therefore vital that we take action to protect not only our own position but, in the final analysis, that of our customers."

International concern about Saudi Arabia's financial health has increased since the 1991 Gulf war, which cost the kingdom about \$60bn, and because of the continuing weakness in the price of oil. In an effort to answer International Monetary Fund concerns over the size of the budget deficit, the Saudi government announced at the start of the year that it would cut spending by 20 per cent.

A western diplomat in Riyadh conceded yesterday that many Saudi businessmen were pessimistic about the short-term economic outlook, but stressed that Saudi Arabia's ability to pump 8m barrels of oil a day for the next century guaranteed its long-term economic viability. NCM warned more than two months ago of its concern over lengthening payments delays and said amounts outstanding were "significant". It added that the payments delays were affecting all areas of the economy, and affecting Saudi buyers' ability to meet commitments to overseas suppliers.

Since then, NCM said: "The



Forced to quit: industry minister Neil Hamilton arrives in Whitehall

## Major orders probe into public life rules after sleaze claims

By Philip Stephens,  
Political Editor

Mr John Major yesterday ordered the most sweeping investigation for 50 years into standards in public life after the mounting allegations of sleaze in his government forced the second ministerial resignation within a week.

During a day of high drama at Westminster, Mr Neil Hamilton, the industry minister named last week as the recipient of hospitality from the Harrods owner Mr Mohammed Fayed, was forced by Mr Major to quit the government.

His resignation came just 90 minutes before Mr Major told MPs he had set up an independent commission chaired by Lord Nolan, a leading judge, to carry out a fundamental review of the rules applying to holders of public office. The commission will act as a standing committee, remaining in place after producing its first report in about six months.

Ministers, MPs, civil servants, council members and officers, and appointees to quangos will all be subject to a review charged specifically to look at their financial arrangements and commercial relationships.

Mr Major told the Commons that he considered Mr Hamilton, who has insisted that he is inno-

cent of any impropriety, was no longer able effectively to carry out his ministerial duties. Earlier Mr Hamilton had expressed regret that he had not declared details of a free stay at the Ritz, the Paris hotel owned by Mr Fayed, in the Commons registry of members' interests.

Last week Mr Tim Smith, a junior minister at the Northern Ireland office, was forced to leave the government after admitting accepting payment from Mr Fayed to table questions in the House of Commons.

Amid an astonishing series of charges and counter-charges between Mr Fayed and the government, Mr Michael Howard, the home secretary, acknowledged that he had been one of the subjects of an investigation carried out by Sir Robin Butler, the cabinet secretary.

In a statement released following the publication of the report, Mr Howard said the outcome had made clear he had not committed any impropriety.

Sir Robin's report, however, did little to suppress the tide of rumour sweeping Westminster about the past links of other Conservatives with Mr Fayed. The

## Sprint forges US telecom alliance with cable groups

By Tony Jackson in New York

The race to create alliances in US telecommunications quickened yesterday with the announcement of a partnership between Sprint, the third largest US long-distance phone company, and three leading US cable companies. The partnership will aim to provide local, long-distance and mobile telephony, as well as multimedia entertainment and information services.

"We will revolutionise what comes in over your telephone, your cable TV and your computer," Mr William Esrey, Sprint chairman, said.

Sprint is to link with Tele-Communications Inc, the largest US cable company, Comcast, the fourth largest, and Cox Cable Communications, the sixth largest. The partners, which claim their existing cable networks run past one third of American homes, said they would seek to affiliate with other cable companies in areas where they were not represented. All phone services would be sold under the Sprint brand name.

The new venture will bid for personal communication service licences in the government auction this December. The auction, which it is thought may raise over \$10bn, has prompted other

### MAIN DETAILS

#### SHAREHOLDINGS

Sprint 40%  
Tele-Communications Inc 30%  
Comcast 15%  
Cox Cable 15%

#### SERVICES

Immediately: Sprint long-distance phone services over local cable networks  
Later: full voice, video and data services  
Will also bid jointly for personal communications services licences in December auction.

bidding alliances such as that announced last week by the regional telephone companies Bell Atlantic, Nynex, US West and AirTouch.

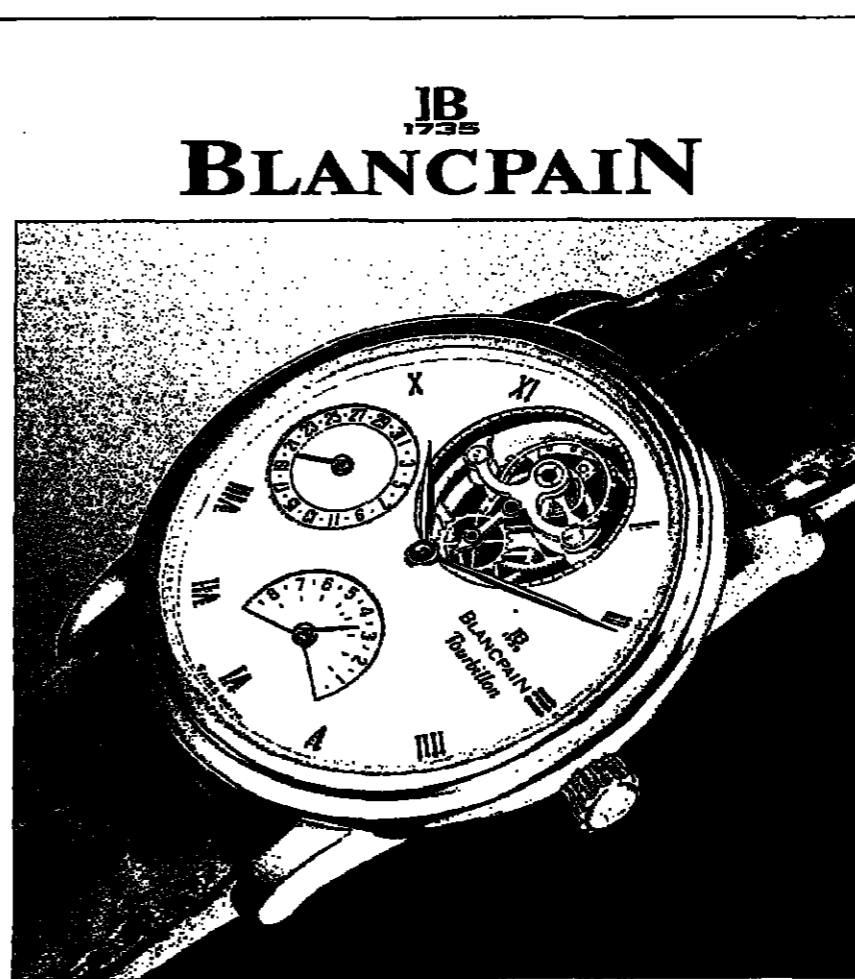
The Sprint partners refused details on the scale of the investment. Much would depend on their bidding strategy in the auctions, they said. Mr James Kennedy, chairman of Cox, said the investment was "not a lot of money given the scope of the venture". Sprint will own 40 per cent of the venture, TCI 30 per cent and the other two 15 per cent each.

The alliance is also a response to the challenge set by the recent merger of AT&T and McCaw, respectively the biggest long-distance and mobile phone companies in the US. Unlike that merger, it has to overcome the regulatory rules against cable companies competing in local telephone services.

Mr Brian Roberts, president of Comcast, said: "The timing [of the venture] depends on how well our government acts to put the essential rules in place." Legislation to allow cable and local phone companies to compete in each others' markets collapsed last month in Congress.

Mr Esrey said: "We feel optimistic that we will get national legislation this year, or if not, the year after." As a back-up, he said, the partners would lobby individual states for changes in the regulations. Included as part of the new company will be Teleport, an existing joint venture between the three cable companies and a fourth, Continental Cablevision. Teleport offers specialised local telephone services to business in 19 US cities. The partners said they were in discussions with Continental about its minority interest.

Lex, Page 16



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## NEWS: EUROPE

## How Kohl linked EMI choice to Delors succession

Germany threatened to block the candidacy of Mr Rüdiger Lubbers as president of the European Commission unless the Dutch premier dropped his opposition to Frankfurt as the site for Europe's future central bank, according to a confidential Dutch government memorandum.

The memorandum is the first evidence that Chancellor Helmut Kohl linked the location of the future central bank to who should succeed Mr Jacques Delors. It also explains Mr Kohl's resolute opposition to Mr Lubbers, recently retired as the longest serving prime minister in Dutch history.

But the document confirms, too, how Mr Kohl saw the location of the European Monetary Institute in Frankfurt as the absolute minimum needed to assuage the German public's fears about giving up the

## Lionel Barber reports on a confidential memo revealing the extent of German arm-twisting over siting of the European Monetary Institute in Frankfurt

D-Mark in a future European monetary union. This is despite European allies' worries about strengthening Frankfurt as a financial centre in charge of a *de facto* D-Mark zone.

In an interview yesterday, Mr Piet Dankert, the former Dutch minister for European affairs and current member of the European parliament, yesterday confirmed the authenticity of the memo, first disclosed at the weekend by the Dutch KRO public television service.

Mr Dankert singled out a high-level diplomatic exchange in Bonn on October 21, 1993, in which Mr Joachim Bitterlich, the Chancellor's top foreign affairs adviser,

attacked Mr Lubbers' opposition to Frankfurt as the appropriate location for the EMI.

Mr Bitterlich warned Mr Dankert that this opposition would have "consequences", with Mr Kohl turning to another candidate for the top Commission post.

Mr Kohl's private office yesterday denied any connection between the location of the EMI and the Delors succession, or that Mr Bitterlich had raised the matter during Mr Dankert's visit to Bonn.

However, Mr Dankert said he recalled receiving a veiled warning about the EMI connection from Mr

Bernd Schmidbauer, a senior German official, which was then delivered more forcibly by Mr Bitterlich. Mr Dankert said: "There is not the slightest doubt that the conversation took place. Because of its explosive nature, I asked for an immediate note to be taken down."

He relayed the German threat to Mr Lubbers at a meeting early the following morning. Mr Lubbers then sought a meeting with Mr Bitterlich two days later in which a second veiled threat was made, according to the KRO broadcast.

Senior German officials familiar with the meeting argued that it made no sense for the Bonn govern-

ment to issue a direct threat to Mr Lubbers because, at that time, he had failed to announce his candidature to succeed Mr Delors.

But the officials conceded that the strongest representations had been made to the Dutch government to drop their campaign to locate the EMI in Amsterdam or, as a second best choice, Bonn. The officials said the matter turned on German's sovereign right to choose where it wished to place the future central bank.

European Union leaders finally agreed to Frankfurt at a summit in Brussels on October 29, 1993. Mr Kohl subsequently asked Mr Jean-

Luc Dehaene, the Belgian prime minister, to become a candidate to succeed Mr Delors. France later backed the Dehaene candidacy, despite President François Mitterrand's preference for Mr Lubbers.

However, the UK, with tacit Dutch support, objected to the Franco-German plan and vetoed Mr Dehaene at the European summit in Corfu last June. Mr Kohl called a second summit in mid-July in which he secured a consensus in favour of Mr Jacques Santer, prime minister of Luxembourg.

Many MEPs objected to Mr Santer and raised questions about the procedure for selecting the president of the Commission, a post which Mr John Major, Britain's prime minister, described as one of the most important in the world.

## US hails Moscow reform effort

By John Thornhill in Moscow

The rouble's recent fall has served as a "wake-up" call for the Russian government creating an important opportunity for a serious stabilisation programme next year. Mr Larry Summers, US Treasury under-secretary for international affairs, said in Moscow yesterday.

Following talks with senior Russian officials about the reform process and the 1995 budget proposals, Mr Summers said he took an encouraging report back to Washington. "It is clear that Russian economic reform is at an important crossroads and it is clear that the government is charting a course forward," he said. "I welcome the clear intentions from all the government officials I met with of a commitment to serious stabilisation."

He warned, however, that the erosion of the tax collection system and the growth of organised crime posed serious threats. Mr Summers said tax revenues were 4 per cent of gross national product less than they were a year ago. "Reversal of that kind of erosion will be central to the stabilisation effort," he said, suggesting what was needed was to collect more tax money at lower rates from a broader base.

The austere budget proposals for 1995 envisage that further monetary tightening will reduce inflation to 1 per cent a month by the end of the year. The federal budget deficit would also be kept within 8.3 per cent of gross domestic product.

One Group of Seven official said: "What is under discussion is the prospect of a real stabilisation not just a slowing down of inflation. That means more reform and potentially more direct financial support than has come from the IMF so far."

But some western economists warn that the government has talked tough before and bowed to the pressures of the industrial lobby to issue more credits. The 1995 budget is also expected to have a rough passage through parliament and the ability to implement the current proposals is far from certain.

Mr Oleg Soskovets, Russia's first deputy prime minister, said yesterday that the government also had to change the "oil export structure" and revise the taxation system to achieve financial stabilisation.

Mr Summers said the recent currency volatility had been a stark warning of the dangers of loosening the economic levers. "I do not think that there is any question that their monetary and credit policies in late summer were an important contributing factor in the fall of the rouble," Mr Summers said.

## Brussels warns of future steel industry crisis

By Emma Tucker in Strasbourg

Europe's steel industry risks another crisis in the future because of its failure to deliver crucial capacity cuts, warned Mr Karel Van Miert, European commissioner responsible for competition. He was announcing the death of the Commission's steel restructuring plan, created two years ago to help restore the beleaguered industry to health during Europe's deep recession.

Mr Van Miert said industry's failure to stick to the plan had left it with overcapacity in the EU of some 20m tonnes. "It is unfortunate that in this plan not all the actors did what needed to be done," he said.

Under the plan, Europe's steelmakers were required to make minimum cuts in capacity of 19m tonnes, but fell short of this target by around 3.5m tonnes. Enthusiasm for the capacity cuts were off as international steel prices began to recover steadily.

Disbandment of the plan means that there will be no more discussion between the Commission and industry over the state of the market, with the Commission dropping its quarterly guidelines for production and delivery volumes. In addition, measures to restrict imports from eastern Europe - in particular from Slovakia and the Czech Republic - will be dropped. "Normal competitive conditions will apply," said Mr Van Miert. The German Steel Federation

criticised the decision, saying that its members had done their part to cut capacity. "Trusting that the European Commission would continue its efforts for market stabilisation until a successful conclusion." Since 1992 German companies had made decisions to cut 6m tonnes of crude steel and almost 8m tonnes of hot-rolled products, it said.

Industry Commissioner Martin Bangemann has said the EU industry was wrong to put off needed restructuring because of a temporary recovery in the market. "They'll be knocking (on the door) again in three years time," said a Commission official.

The recovery is in part due to increased exports to the US and Asia, said Mr Alan Coates, a steel analyst at Paribas Capital Markets in London. He said the industry cannot depend on exports for continued health, especially since imports from eastern Europe and Russia were likely to grow.

Despite the collapse of the rescue plan, a package of social subsidies, designed to ease the impact of steel plant closures, will continue to apply until the end of 1995, the Commission said yesterday.

The Commission has also decided to recommend to member states that they accept the German government's bid to rescue EKO Stahl, east Germany's largest steel mill, through a hefty state subsidy. Steel back in the melting pot. Page 14; Lex, Page 16

## Relations between UN force chief and government at new low

## Bosnia politicians call for removal of Rose

By Bruce Clark, Diplomatic Correspondent

Relations between the Bosnia's Muslim-led government and the United Nations plunged to a new low yesterday as Sarajevo politicians demanded the removal of General Sir Michael Rose, the UN force commander.

Bosnian officials and the UN also exchanged harsh words over the origin of a unprecedented fire-fight between government soldiers and French peacekeepers on the slopes of Mount Igman outside Sarajevo yesterday.

Eight Bosnian political parties lent their support to a demand that "Rose must go" which was published in Sarajevo's daily newspaper, Oslobođenje.

They accused the British commander, whose year-long tour of duty ends in January,

of having "done everything to water down the decisiveness of the free world in punishing crime and fascism". They said Gen Rose was more interested in protecting British interests than in implementing UN resolutions.

"We will be asking for an impartial, objective commander, one who will implement UN resolutions on the ground... and not a general who protects the interests of his government."

UN spokesman Colonel Tim Spicer said Gen Rose was not concerned about the criticism and that there was no question of his leaving before his 12-month assignment ended. "The job of a peacekeeper as opposed to a peace enforcer is a difficult path to walk and there is no question that General Rose has walked a central line in furtherance of the mission given to him."

Gen Rose had followed "a strong line in furtherance of United Nations policy and sticking to agreements that have already been made and may be unpopular in some cases".

The reputation of Gen Rose among residents of Sarajevo soared last February when his tough diplomacy helped to bring an end to the siege of the city and restore relative normality to daily life.

His standing in the eyes of Muslims sagged two months later, when he was perceived as too soft in his response to the Serb assault on the enclave of Gorade, and it fell still further in August, when the UN failed to stop the Serbs from reimposing a partial blockade of Sarajevo.

But UN officials stress that right from the beginning, the general's efforts to ensure a normal life for as many Bosnian civilians as possible have



UN force commander, Gen Sir Michael Rose (right), pictured in Vitez earlier this year

been met with far from universal co-operation from Bosnian officials and generals. The February ceasefire in

Sarajevo required some very tough talking to Bosnia's Muslim leaders as well as to the besieging Serbs.

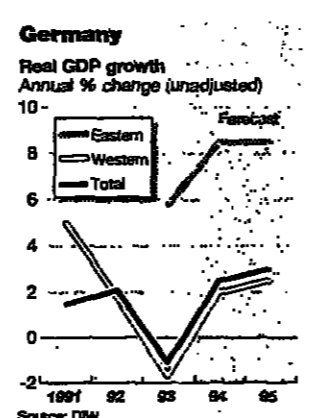
## Report hails 'lively' Germany recovery

By Michael Lindemann in Bonn

The German government was quick to claim yesterday that its policies had been vindicated by a report from the country's six leading economic institutes predicting that the economy would grow by 2.5 per cent this year and by a further 3 per cent next year.

Presenting their twice yearly study, the most comprehensive check-up on the health of the German economy, the institutes said the recovery had been "surprisingly early and lively". In April they had predicted that German gross domestic product would rise by 1.5 per cent.

"Now we can see that the government's economic assumptions were not just calculated optimism but based on the improved conditions for



growth which have been achieved," Finance Minister Theo Waigel said. For the third time running, however, the left wing Berlin-based German Institute for Economic Research (DIW) dis-

agreed with the other five institutes, arguing that the rise in long-term interest rates posed a threat to economic recovery. The institute said GDP would grow by 1.5 per cent next year.

The report says Germany's recovery had initially been driven by exports but there was now evidence that capital investment had become the driving force of the recovery. Responding to the report, however, the influential Federation of German Industry (BDI) said there were fewer grounds for optimism because companies were still not earning enough to make substantial investments.

Inflation, which has failed to fall below 3 per cent in August and September, is forecast to dip to 2.5 per cent next year, the report said. Continuing

inflationary pressure caused by the growth of the M3 money supply, the key indicator used by the Bundesbank, suggested there was no need for the central bank to make any substantial cuts in its leading interest rates, the report said.

The institutes also recommended the government increase the budget deficit in order to relieve companies and consumers of "massive tax increases". But the association which represents Germany's largest private banks, said it would be wrong to raise the budget deficit in order simply to cut expenditure. "A strict reduction of spending and the reduction of the amount of taxes levied should go hand in hand," the Federation of German Banks said.

The report coincides with

figures which show that Germany's trade surplus rose sharply in August to DM7.1bn (£2.5bn), double the July level. Exports were 14 per cent up on the previous year while imports rose 6 per cent.

The trade surplus for this year totalled DM47bn, 25 per cent higher than for the same period a year earlier. The current account deficit, however, almost doubled to DM35.5bn, partly because of the high level of payments by German tourists abroad.

Meanwhile the public sector financing deficit confirmed the positive trends, falling by DM23bn to DM6bn for the first half of this year, better than the 1994 budget plan had indicated according to a statement from the Federal Statistics Office.

## MPs' amendments may hit revenue measures and pension reform

## Italian budget faces big hurdles

By Robert Graham in Rome

The Italian government is struggling to retain the identity and objectives of the 1995 budget amidst a vast quantity of amendments being tabled by the right-wing coalition and the opposition alike.

The latest and most important amendment has been introduced by the government to offset a poor response to one of the main revenue raising measures. The move concerns a loosening of the rules regarding the amnesty on illegal construction and property development to encourage more taxpayers to take advantage of the concession. The amnesty,

based on encouraging persons to register construction carried out without proper permission through the payment of a small fine, has failed to prove attractive. The measure was introduced before the summer and is due to yield L2,500bn (£1.6bn) this year and close to L10,000bn next year.

But so far only L6bn has been paid in and the initial closing date for registrations is October 31. Thus, the government is further reducing the scope of sanctions applied to illicit buildings, especially on first houses.

The opposition has already challenged the original measure and a number of regional

administrations have challenged the decree on environmental grounds in the constitutional court, adding further to the confusion over the likely revenue yield.

More than 1,000 amendments have been tabled to the budget - in almost equal proportion between the government members and the opposition. The bulk of the changes relate to the controversial pensions reform, following the government's decision to try to eliminate the many anomalies and hardship cases created by the proposals submitted on September 30.

According to latest estimates, the changes will add an

extra L1,000bn to the pensions bill in 1995 and even more in the following two years. The treasury is adamant the budget deficit target of L138,000bn, equivalent to 8 per cent of GDP, cannot be altered. However, the more the original measures are altered to satisfy different interest groups, the harder it will be to maintain this target.

Yesterday the trade unions announced they were going ahead with plans to organise a 1m strong demonstration in Rome on November 12 to protest against the budget and pension reform. This is a follow-up to the general strike two weeks ago.



Berlusconi: his 1995 draft budget assailed on all sides

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## EUROPEAN NEWS DIGEST

## Brussels pushes hard on telecoms

The European Commission yesterday challenged member states to speed up the liberalisation of Europe's telecommunications industry. The Commission decided to adopt the first part of its green paper on infrastructures, which is aimed at opening those that are currently only authorised to carry specific services - for example rail and energy networks - to other liberalised services. This would cover video-on-demand and distance learning, for example, but not basic voice telephone services, which will not be liberalised until 1998. Mr Karel Van Miert, commissioner responsible for competition, said the Commission had also backed in principle the aim of liberalising basic telephone infrastructures - which remain largely under monopoly control - by January 1 1998, at the same time that voice services are opened up to competition. The Commission also intends to present member states with proposals, at a meeting of telecoms ministers next month, for liberalising cable television networks. The Commission's decision yesterday should allow the council of ministers to establish a clear timetable for liberalisation before the Essen summit in December. *Emma Tucker, Brussels*

## Möller quits FDP post



Mr Jürgen Möller (left), chief rival to Mr Klaus Kinkel, Germany's foreign minister and head of the Free Democrats (FDP), yesterday resigned from his party post in protest against being excluded from coalition talks with Chancellor Helmut Kohl. Mr Möller, who went so far as to blame Mr Kinkel for the FDP's poor showing in the recent federal election, quit as party leader in the state of North-Rhine Westphalia. The FDP saw its share of the vote reduced from 11 per cent in 1990 to 6.9 per cent two weeks ago. Officials in Bonn said Mr Möller's resignation was unlikely to heal the policy rifts in the FDP.

The party is sharply divided between those who want a return to libertarian values and greater deregulation of the market, and those who have compromised the party's old traditions in favour of remaining as a junior partner in Mr Kohl's Christian Democratic-led coalition. The future strategy of the party will be debated at a special meeting in December. Mr Möller, a former economics minister who was forced to resign his cabinet post in late 1992 for abuse of office, would not discuss his future plans. *Judy Dempsey, Berlin*

## Hungary in public sector purge

Hungary's new Socialist-led administration yesterday sacked most of the directors of two large state companies and is expected to announce similar changes at its oil and electricity monopolies shortly. Mr László Pál, trade and industry minister, said the head of MVM, the electricity monopoly, had used company revenues to support the previous conservative government's electoral campaign and that several MVM board members were not qualified for their jobs. He said eight of the 13 board members would be removed next week. AV Rt, the state holding company, said it had dismissed the general director of Antenna Rt, the radio and television transmission operator, from its board for failing to notify it and co-directors of a Pilsen (25.8m) contract. It said it had dismissed five of the nine directors of TVK, the country's largest chemical company, in order to facilitate privatisation. Western observers in Budapest welcomed some of the changes, which had been expected for some time, and said that overall the new appointees were well qualified. *Virginia Marsh, Budapest*

## Turkey talks tough to Greece

Turkey could "whip Greece" if the two Nato allies fight over rights in the Aegean Sea, the Turkish foreign minister, Mr Murat Soyak, said on Turkish television on Monday night. "We don't want a reckoning. We know who will win if there is one. We can whip Greece," Mr Soyak said. He added that Turkey was making military preparations but did not elaborate. "If you want peace you must be prepared for war," he said quoting a Turkish saying. Greece maintains it has a right to double its territorial waters to 12 nautical miles but has no plans to do so. Turkey has said Greece's enforcement of a 12-mile limit would be reason for war. Many Greek islands are close to the Turkish mainland and extension of Greek waters would effectively deny Turkish boats access to the sea. The two countries backed down from the brink of war over mineral rights in the Aegean Sea in 1987. *Raezer, Ankara*

■ US assistant secretary of state John Shattuck yesterday voiced his "greatly heightened concern about the growing cycle of violence" in Turkey. During a visit, he condemned the "terror" of the Kurdish insurgency in the south-east of the country but called on Turkey to seek a political, rather than military, solution to the conflict. *John Barham, Ankara*

## Polish broadcasting row grows

In a continuing row over commercial television and radio licences, Poland's parliament is to be asked to set up a committee to examine whether Mr Janusz Zaorski, the head of the TV and Radio Council regulatory body, is infringing the country's broadcast laws. The motion came after deputies yesterday asked Mr Zaorski, who was appointed by President Lech Walesa last summer, why he was delaying signing a broadcast licence awarded months ago to the French pay-TV channel, Canal Plus. The French channel is at the head of a queue of broadcasters promised commercial licences, but are awaiting Mr Zaorski's confirmation. *Christopher Bobinski, Warsaw*

## ECONOMIC WATCH

## Austrian industrial output rises

Austria's industrial output rose 4 per cent year-on-year in August following a 5 per cent rise in July. The figures confirm the strength of the economic recovery following the country's short and shallow recession last year. Economists have recently raised their forecasts of real GDP growth this year to nearly 3 per cent after a 0.5 per cent fall last year. Industrial production is being supported by buoyant exports, a housing construction boom and undented consumer confidence. Inflation remains a concern, but the annual rate eased to 3.1 per cent in September from 3.2 per cent in August. Economists hope that pressure on consumer prices will grow when the country joins the European Union at the beginning of next year. The other worry, the public sector deficit, is more likely to be aggravated by EU entry as well as by the less stable political situation following national elections earlier this month. *Ian Rodger, Zurich*

■ Wholesale prices in Denmark rose by 0.1 per cent from August to September, and were 1.7 per cent higher than in the same month last year. This supports government claims that despite a predicted GDP growth rate of 4.6 per cent this year there are no signs that inflationary pressures are increasing. ■ Swedish producer prices rose 0.4 per cent in September from August, when they rose 0.8 per cent. Year-on-year, producer prices rose 5.5 per cent.

## Balladur avoids showdown over Chirac

From Reuters in Paris

The French prime minister, Mr Edouard Balladur, backed out of a potential showdown with Mr Jacques Chirac, leader of his Gaullist RPR party yesterday in the presence of the party's leader and his presidential rival, Mr Jacques Chirac.

Mr Balladur surprised deputies by cancelling an address to the RPR caucus in parliament at which he had been expected to come under fire for launching personal criticism of Mr Chirac on Monday.

Both men are undeclared RPR rivals to succeed President François Mitterrand next May and their infighting is encouraging the opposition

Socialists, routed in a 1993 general election. But Mr Balladur denied he had pulled out at the last moment. "I didn't choose. It was decided weeks ago," he said.

His remarks contradicted an official agenda distributed by his office on Monday, which said he would visit the national assembly on Tuesday afternoon. The RPR floor leader, Mr Bernard Pons, said he was only told late yesterday morning that Mr Balladur was not coming. Instead, Mr Balladur was to visit RPR members at the senate, where he was less likely to face hostility.

Mr Balladur criticised Mr Chirac on Monday in an interview with the daily *Le Figaro*

for failing to speak out in defence of the franc when the currency was under attack last year, saying Mr Chirac had stayed silent for reasons of party expediency. "For a long time, Jacques has taken refuge in his party as if it were a citadel. Is this really the spirit of the Fifth Republic?" the prime minister said in his open assault on Mr Chirac after a series of veiled criticisms.

Mr Chirac responded yesterday by calling for an end to "futile polemics and phoney quarrels", reminding unnamed politicians that they should serve France with dignity and responsibility.

La Lettre de la Nation, the official newsletter of the RPR,

was more direct. It said the prime minister "has deeply wounded elected members and others in the RPR".

The party's assistant general-secretary, Mr Eric Raoult, said: "If we have an RPR prime minister today, he shouldn't spit on his own political movement." Many pro-Chirac deputies said Mr Balladur owed his position as prime minister to Mr Chirac.

Meanwhile, the former French president, Mr Valéry Giscard d'Estaing, said yesterday that rivalries on the right were no obstacle to winning the presidency. He noted that the right had three times fielded two rival candidates since 1968 and won.



Balladur: cancelled a speech in Paris to RPR deputies

## Anglo-French ties to grow despite 'teasing'

By Bruce Clark, Diplomatic Correspondent

Britain and France are edging towards closer co-operation, particularly in defence and security, despite the two countries' history of ill-tempered spats and sharply contrasting rhetoric over the future of Europe.

Mr Douglas Hurd, the UK foreign secretary, told an Anglo-French audience in London this week that "there are really no two substantial countries more similar than France and Britain". "We differ occasionally,

though almost always only by a degree or two, in our response to particular world events," he added. "But when it comes to the point... we are side by side."

While acknowledging the existence of "mutual teasing and aggravation" between the British and French media, he stressed the two nations' virtual identity of views over Bosnia and argued that their ideas on the European Union were not far apart. "Neither for Britain nor for France is there attraction in a vision of Europe which erodes national identity," the

foreign secretary told the Franco-British council.

He stressed that for now, Britain and France were the only two European countries which had extensive global interests, and therefore maintained a defence capability that was well adapted to overseas deployment.

Germany, prevented until recently by political and constitutional barriers from sending troops into combat overseas, is preparing at least one division for global deployment. However, this is not expected to be ready until the year 2000. Mr Hurd con-

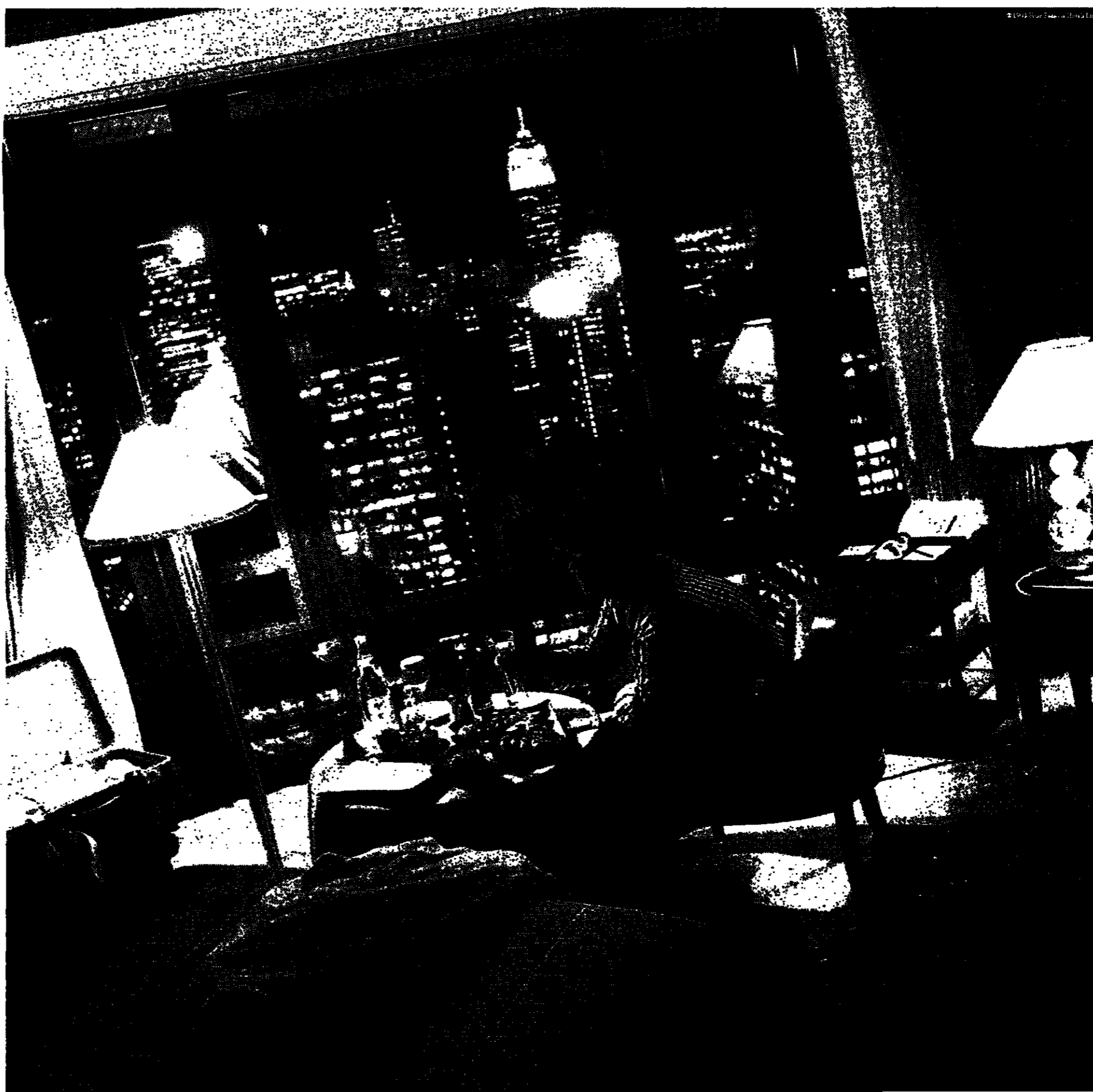
firmed that the UK and France were engaged in discussions about closer co-operation in military aviation, which were expected to come to a head at the Anglo-French summit in Chartres next month.

British officials say these discussions are focusing on relatively technical questions, such as common procedures for sharing air space, which would make it easier for the UK and French air forces to co-operate in humanitarian or peace-keeping missions overseas. French press reports have suggested that a joint headquar-

ters, or even a joint intervention force, could be established. But one British official insisted that at this stage, such speculation amounted to "adding two and two and making eight".

Setting aside the intense Anglo-French wrangling which has often marred discussions about European security, Mr Hurd said both countries were committed to closer integration of the continent's defence effort. "The contribution of both Britain and France will be indispensable," he said.

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## NEWS: INTERNATIONAL

## Japan business index signals recovery

By William Dawkins in Tokyo

Japan's official index of current business conditions hit a seven-year high in August, suggesting the recovery may be becoming more broadly based.

The government Economic Planning Agency's coincident indicator, a basket of 11 economic and business measures, rose above the 50 per cent dividing line between growth and decline in August for the first time in three months. It hit 90 per cent, the highest since July 1987.

This eases pressure on the

Bank of Japan to cut interest rates, when the yen is strengthening again, and reduces strain on the government in the middle of a difficult parliamentary session.

The EPA's leading indicator, a measure of the three-to-six-month outlook, was even stronger, at 100 per cent, the eighth month at which it has stood above economic equilibrium. Within this, 10 of the leading index's 13 components were pointing upwards. This suggests the current upturn has more depth than the economic revival of spring 1993 which turned out to be a false

start, Mr Dick Beason, senior economist at James Capel Pacific, said.

Four components of the leading index shifted from decline to growth between July and August: graduates' job prospects, the amount of floorspace used by companies, money supply, and manufacturing industry profitability. Most of the other components continued a regular improvement.

Evidence that patches of weakness still exist in important parts of the Japanese economy emerged yesterday with poor results from the vehicle and department stores

sectors. Vehicle production fell by 7.2 per cent to 5.1m units in the six months to September, slightly less than the 10.4 per cent decline of the first half of 1993. The latest result was the third-sharpest six-monthly fall in 20 years, the Japan Automobile Manufacturers' Association said.

Department stores, a victim of discount retailing, recorded a 2.1 per cent sales decline in the year to September, the 31st monthly decline running. It was, however, an improvement on the 3.6 per cent decline shown in August. Business

continues to crawl, the Japan Department Stores Association said.

The cabinet yesterday adopted a plan to spend ¥6,010bn (\$62bn) to prepare rice farmers for the gradual opening of their market.

The package, prepared by the three parties of the ruling coalition, clears the way for parliament to ratify the trade liberalisation bill needed to comply with the Uruguay Round of the General Agreement on Tariffs and Trade. Japan aims to ratify the Gatt accord in the present parliamentary session, ending on

December 3. As part of the accord, a previous government agreed last year to import 4.8 per cent of its annual 10m tonne rice consumption over the next six years, and replace import quotas with tariffs some time after that. The farm aid package will be spent over the same period.

The aid programme was criticised yesterday for failing to do enough to encourage large efficient farms, at the expense of traditional small paddy fields. The government is bargaining that the cash will at least compensate farmers for the opening of the rice market.

## Market in auto electronics set to double

By Kevin Done, Motor Industry Correspondent

The market for automotive electronics is forecast to double from \$40bn (£25.3bn) to \$80bn a year between 1993 and 2000, according to a report from the Economist Intelligence Unit.

The study suggests that the biggest increases will come in the value of navigation equipment, while the installation of airbags will continue to rise rapidly. Electronic systems are forecast to account for 30 per cent of the production cost of a car by 2000.

The value of the electronics content of the average car has already quadrupled from \$300 in 1980 to \$1,200 in 1990. According to the report, this is set to increase to \$1,500-\$1,800 per car in 1995 and to rise further to \$2,300-\$2,500 in 2000.

The EIU study claims that the rise in the use of electronics in cars is being driven by the introduction of tougher legislation on safety, emission controls and vehicle security, as well as by technological developments in the electronics industry and the need by car makers to gain a competitive advantage.

The value of the car electronics market worldwide is forecast to rise to \$80bn-\$85bn in 2000 from \$43bn-\$58bn in 1995 and \$39.7bn in 1990. Electronic systems for engines, transmissions and

chassis will remain the single most important market sector, with sales forecast to rise from \$13bn in 1990 to \$23bn in 2000.

The biggest increase will come in driver information systems, however, where the value of the market is expected to jump from only \$2bn in 1990 to \$18bn by 2000. Navigation systems will be able to give routes and update them to take account of changes in traffic.

Car radio/cassette players will play an important role in receiving and storing traffic information as well as details of hotels, restaurants and service stations in an area.

Several companies are already developing components which will increase safety in poor light and in dense traffic, including radar, fog sensors, infra-red cameras, navigation systems and intelligent cruise control.

The development of inexpensive radar, which is seen as critical to the development of intelligent cruise control, is claimed to be better than infra-red technology for use in collision avoidance sensors. Smart cards are expected to replace ignition/door keys, as they will be able to be used as driving licences, to actuate roadside emergency telephones, and to allow the driver to adjust seat and mirror positions.

The Electronics Revolution in the Motor Industry, 1995. The EIU, 15 Regent Street, London, SW1Y 4LR

## Jordan 'needs help to ease burden of debt'

By George Graham in Washington

Jordan needs relief from its heavy foreign debt burden if it is to reach the kind of growth rates necessary to bring a real peace dividend to its population, the World Bank has warned in a new study of the impact of peace on the Jordanian economy.

Jordan's economic reform programme could bring growth of up to 4 per cent a year, but the World Bank calculates the country needs to achieve a higher growth rate.

"To really make a difference to high unemployment rates, to really cement the peace, Jordan needs around 6 per cent growth per year," says Mr Carlo Koch-Weser, the World Bank's

vice-president in charge of the Middle East and North Africa. That would require private investment rates of about 20 per cent of gross domestic product, the report says, a rate which will be impossible to achieve so long as Jordan is struggling under the burden of more than \$7bn (\$4.6bn) of foreign debt, roughly 1.5 times its GDP.

"For the man in the street, the question is what has peace done for me, and that is where you see the urgency of doing something about the debt to make the leap from 4 to 6 per cent growth," Mr John Page, the World Bank's chief economist for the region, says.

To reduce Jordan's debt burden to about 75 per cent of GDP by 1998, the World Bank

calculates that about \$1.7bn of debt reduction would be needed. Full debt forgiveness of about \$3.3bn in 1994 would greatly improve Jordan's macroeconomic outlook and "significantly enhance the prospects of strong popular support for the peace process," the report says.

The report warns that the economic impact of peace will probably be felt more slowly than many hope. Among the most important longer-term gains will be improved co-operation on water issues. Mr Koch-Weser warns that without action, all the countries of the region face water shortages in the next 15-20 years, but Jordan's water crisis is perhaps the most imminent. Frayed prospects, Page 15



An Israeli soldier stands guard on a road between the West Bank and Jerusalem yesterday

## World Bank clears \$150m loan Vietnam 'enters tougher phase'

By Peter Montagnon, Asia Editor

Vietnam's economic adjustment programme is entering a more demanding phase now that relatively easy price reforms have been accomplished, the World Bank said yesterday.

Announcing the approval of a \$150m, 40-year structural adjustment loan, its fourth to Vietnam since lending resumed last year, the bank singled out restructuring of state banks, privatisation of public companies and trade reform as still to be tackled.

Vietnam should also introduce further legal reform to provide a basic civil and commercial law code and simplify investment rules to facilitate business activity.

The reform programme had produced "impressive results", especially since it was begun without real outside financial help. But "some weaknesses are evident in the reform pro-

gramme and in the economy". Vietnam remained a poor country with per capita income below \$200 a year and sharp regional disparities in living standards. Weak infrastructure and an inefficient financial system hindered investment.

International donors could provide significant finance for development, but the government would need effective institutions to take most advantage of development assistance.

The financial sector was burdened by bad debts in state-owned commercial banks, poor accounting and management practices, and high taxation. The trade system should be reformed to abolish import permits and introduce a simplified tariff structure.

This year Vietnam is committed to reducing its fiscal deficit to 2.7 per cent of GDP from 5.2 per cent in 1993. It is expected to rise to 3.3 per cent in 1995.

## Chinese gear up for huge rise in cars by 2010

By Tony Walker and Shi Junbao in Beijing

China's cars are projected to rise dramatically in numbers to 22m by the year 2010, with individual ownership increasing sharply to 60 per cent of all vehicles on the road, against less than 5 per cent at present, an authoritative study says.

This predicted increase of car ownership and production in China will clearly have enormous implications for the automotive sector internationally.

The study, by a group within the Chinese bureaucracy called the Strategic Development Research Team of China's

Family Car, forecast that by 2010 China will build 3.5m cars a year, with two-thirds of them being sold to private motorists. Total production value of the automotive sector will reach ¥420bn (\$31.6bn) a year, with an extra ¥1,020bn being generated by associated industries.

The study estimated the automotive sector would be generating ¥90bn annually in tax revenue by 2010 and would have created 15m new jobs. "Having a family car will signal that a Chinese citizen's life has turned from a moderately well-to-do to a rich one," the study reported.

Publication this week in the Economic Daily of the study

China's spending on infrastructure would be about \$500bn (\$316bn) over the next decade, Mr Liu Zhongli, the country's finance minister, told an Asian Development Bank-sponsored conference in Beijing, writes Tony Walker.

coincides with a debate within the Chinese bureaucracy about the desirability of increased private car ownership. Mr He Guangyuan, minister of machinery industry warned this week against the danger of "old attitudes" to car ownership hindering development. "If we can't see how necessary it is for car-ownership to

become widespread and don't actively support a private car market, it would be hard for car-making to become a pillar industry," he told the China Business Times newspaper.

Rapid development of the automotive sector is meeting opposition from bureaucrats who see car ownership as bourgeois. Sections of government

fear China's infrastructure would be unable to cope with so many cars on an over-taxed road system.

China recently unveiled a new car industry policy that envisages the establishment of three or four car manufacturing conglomerates by 2000, engaged in the mass production of family sedans. The policy instituted a freeze on new manufacturers entering China until 1996 to enable present operators to build up strength.

Volkswagen, in partnership with the Shanghai Automotive Industry Corporation, is China's biggest maker of passenger cars. In 1993 it built 100,000 Santanas, a medium-sized fam-

ily car, out of a total of 234,000 sedans made throughout China, which plans to be producing 1.35m passenger cars a year by 2000, with 50 per cent of the market supplied from local production. Output would rise to 3.5m-4m units by the year 2010.

From 1979 to 1993 the number of cars in China grew from 150,000 to 1.4m, of which 50,000 are privately owned. Cars owned by individuals or families will amount to about 20 per cent of total cars on the road in China in 2000.

Percentages of individual car ownership would rise to 40 per cent in 2005 and 60 per cent in 2010.

## Widow to carry on poll fight

By Stefan Wagstyl in New Delhi and Reuters in Colombo

Sri Lanka's United National party, the main opposition grouping, last night chose the widow of Mr Gamini Dissanayake to be his successor as its candidate for next month's presidential election. On Monday, along with 50 others, he was killed by a suicide bomber.

The UNP, which held power for 17 years until its August election defeat, had been widely expected to pick Mr Ramil Wickremasinghe, 45, the former premier. He led the UNP until the election, but was ousted as its leader by Mr Dissanayake.

Despite her lack of political experience, Mrs Shirima Dissanayake, a lawyer, will be a popular choice to run against Mrs Kumaratunga, the ruling People's Alliance's candidate for the presidency.

A curfew imposed in Colombo on Monday was lifted yesterday but then re-imposed for the night. Police fear the funerals of the bomb victims could prompt demonstrations.

## Sri Lanka fears passions will erupt

Colombo, where Mr Gamini Dissanayake, Sri Lanka's opposition leader, and 50 other people were killed by a suicide bomber on Monday, returned to normal with almost unseemly haste yesterday.

The curfew imposed immediately after the blast was lifted and banks, shops and offices were open. It appeared that after living through two political assassinations last year, Sri Lankans have grown used to the murder of their leaders.

Yet deep concern exists on the island about the lasting effects of Mr Dissanayake's death. The fear is that the passions aroused by the murder of such a popular leader will sooner or later come into the open. They might erupt into street violence as early as the funerals which begin today and end with Mr Dissanayake's state funeral on Saturday.

Or they could linger and affect politics and society in more subtle but equally disruptive ways. "People may not show it, but they are very distressed," Mr Noelan Thiruchelvam, a Colombo lawyer, says.

The public distress is acute because it has come at a time of unprecedented hope about Sri Lanka's future, engendered

## Peace hopes are in doubt during run-up to poll for president, Stefan Wagstyl reports

by the efforts of Mrs Chandrika Kumaratunga, the newly elected prime minister, to end the island's civil war.

Mrs Kumaratunga, who took power in August after 17 years' rule by Mr Dissanayake's United National party, started talks with the Tamil "Tigers" fighting for an independent Tamil homeland. As Mr Thiruchelvam, a Tamil, says: "In Sri Lanka we swing quickly from optimism to despair. Now we are in despair".

The key question is the impact of the assassinations on the peace effort. Even though the police have little evidence linking the attack to the "Tigers", the general assumption in Colombo is that they carried it out.

The "Tigers" have denied responsibility for the assassinations, but their denials carry little weight in Colombo. The security forces believe that only the "Tigers" command the fierce loyalty and access to high-quality explosives needed to organise a suicide bombing.

The "Tigers" have been linked to two deadly suicide

attacks, on Mr Rajiv Gandhi, the then Indian prime minister, in 1991, and Mr Rana-singhe Premadasa, the Sri Lankan president killed last year.

In the weeks since her election victory, Mrs Kumaratunga had built broad-based support among the majority Sinhalese in favour of peace talks, but it seems certain this week's assassinations will undermine this consensus, though it is difficult to say by how much.

"The conditions for the peace talks were favourable. Now there will be great suspicion about the guerrillas' good faith. This is one of the worst consequences of the act," a Colombo-based diplomat says.

Mrs Kumaratunga has prudently postponed talks between government and Tamil representatives which started two weeks ago and were in progress near Jaffna, the Tamil stronghold in the north. She will now face calls for a long delay and for outright cancellation. Army officers, who claimed the government had made too many concessions, will now find it

easier to criticise her.

A crucial test of public opinion will come in the presidential election due to be held on November 9 in which Mr Dissanayake was challenging Mrs Kumaratunga. Mrs Kumaratunga had been expected to win, despite a strong campaign by Mr Dissanayake. His death should generate some sympathy votes for his party and votes from those wanting to protest at talks with the rebels.

But the UNP could lose the support of Mr S. Thondaman, the powerful and politically volatile leader of the tea estate workers' union, wooed away from Mrs Kumaratunga by Mr Dissanayake but who could now swing his support back to the premier.

On balance, Mrs Kumaratunga is still expected to win because the UNP lacks another candidate of Mr Dissanayake's stature. An emphatic victory could stall the talks. Mr Desmond Fernando, a lawyer, says: "I fear there could be a swing against compromise".

Sri Lanka has learned to live with political violence, espe-

cially in the past 18 months, which have seen three assassination attacks. Neither the death of President Premadasa, nor of Mr Lalith Athulathum-dak, an opposition leader, provoked civil unrest or much social or economic disruption. Western tourists, sensitive to political violence, have continued to come to Sri Lanka.

This time too, expectations are that little damage will be done to the economy. The Colombo Stock Exchange's all-share index fell by 31.74 points, 2.85 per cent, yesterday, 1,081.27, but stockbrokers said this was a reflex reaction. The economy remains strong and likely to meet the government's target of 6 per cent growth in gross domestic product this year, after a 6.9 per cent increase in 1993.

Mr Krishan Veerawathan, a manager at the Colombo office of Crosby Securities, the Hong Kong investment broker, says: "A feeling of optimism has been shattered. That accounts for the fall. But I think the market will now stabilise". But much will depend on the run-up to the presidential election and its outcome. If Mrs Kumaratunga fares badly, the hopes of peace vested in her may fade too.

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## EU's export credit rules seen as threat

By David Buchan in Paris

Brussels' plans to harmonise export credit within the European Union risk imposing extra delay and red tape on European exporters just when they face fiercer competition from the US, the leading French credit agency warned yesterday.

Mr François David, president of Coface, the newly privatised agency which underwrites a quarter of French exports, said it was "not absurd to have a common export credit policy". This, he said, was particularly the case when some of Europe's leading exporters were transnational companies, such as the four-nation Airbus consortium, or the Franco-British venture of GEC-Alsthom, and where in the absence of harmonisation the risk appreciation of different EU insurers was very different.

"But exporters often already find it difficult to get a credit at the national level," Mr David said, predicting that harmonisation at the EU level would create further delay with credit offers evaluated by "people [in Brussels] who might not be experienced and who might introduce political arbitrage among the Twelve [member states]". The US and Japan "would be happy to see Europe put itself into another straitjacket", he said.

In July the European Commission proposed "common principles for guarantees and premiums in the area of state-

supported medium and long term credit insurance" with greater transparency in the geographic coverage of different EU credit policies.

At the time, the Commission denied that the plan would impose "a straitjacket on the member states and their agencies", saying it would allow insurers "considerable leeway to diverge from the principles laid down, provided they inform the Commission and other member states".

A senior Commission official said yesterday that the plan, which still has to win approval by the Council of Ministers, emerged out of guidelines prepared by a group of national officials from the Twelve.

A former head of Aérospatiale's international division, Mr David complained that Washington was mounting a "diplomatic-commercial offensive without precedent" in support of its aerospace, military and agriculture exports.

He cited a recent seven-year credit on a US wheat sale to Morocco, noting that credits were supposed to match the lifetime of a product or project, and President Bill Clinton's overt involvement in last February's \$8bn worth of Boeing aircraft to Saudi Arabia.

This newly aggressive policy meant that the US now accounted for 30 per cent of the world total of export credit of more than five years maturity, compared to only 15 per cent three years ago, Mr David said.



Senators Lautenberg (top) and Wofford: believed to have signed Perot's pledge

## Perot group in pledge drive against Gatt deal

By Nancy Dunne in Washington

United We Stand, the network of activist citizens groups established by Mr Ross Perot, the Texas billionaire, has launched a far-reaching drive to get House and Senate candidates to sign a pledge to delay passage of the Uruguay Round implementing legislation.

They are claiming two successes thus far: Senator Frank Lautenberg, a New Jersey Democrat, and Senator Harris Wofford, a Democrat for Pennsylvania. Both have in their states large numbers of blue collar voters, who are inclined to view trade liberalisation with suspicion.

Administration vote counters believe they have the votes to pass the legislation this year. But they are nervous about the anti-Gatt efforts and are urging US businesses to intensify their lobbying efforts as the mid-term elections

approach. One official, who has been on the campaign trail, said the anti-Nafta forces - populists on the left and right - have now "coalesced" behind the Gatt.

United We Stand headquarters in Dallas, Texas, has recommended that local groups urge consideration of the legislation in January "to allow for a full and open debate of Gatt/ WTO's impact on jobs and sovereignty".

This would make impossible the proposed launch of the World Trade Organisation by January 1, 1995.

Mr Perot ran as an independent candidate for president in 1992 and is expected to run again. He took the lead against the North American Free Trade Agreement, debating Vice President Al Gore and in a performance widely seen as hurting his cause.

In this battle, Mr Perot has thrown the thousands of citizen activists who still flock

to his banner. Although he has recommended that they vote for Republicans, Democrats in tight races might well be inclined to take up the anti-Gatt pledge in the hope of gaining - or at least neutralising - opponents' advantages.

The "Perotistas" pledge does not ask for outright opposition to the Gatt deal. Instead opponents are asking that Congress "honour its own budget responsibilities and provide full funding for any law it passes" a feat which has been deemed politically impossible.

The administration was unable to raise the \$300m in programme cuts or tax increases, required under Senate budget rules, to pay for lost tariff revenue over 10 years. It found funding for the first five years but it is being forced to ask for a waiver of the Senate rule, which would require 60 votes.

## Effort to push ahead with WTO

By Frances Williams in Geneva

The 125 participants in the Uruguay Round of trade talks yesterday reaffirmed their intention to establish the World Trade Organisation on January 1 next year by setting a December date for the formal implementation conference that must give the go-ahead.

The decision, by the WTO preparatory committee in Geneva, rests on the assumption that the leading traders - the US, the European Union

and Japan - will ratify by the time of the implementation conference on December 8. Only 30 nations have ratified so far but 50 more are pledged to do so by the end of the year.

Ratification has been held up partly because many countries are waiting for the US, EU and Japan to do so, while they in turn have run into difficulties.

There are no formal conditions for bringing the WTO - and the rest of the Uruguay Round global trade accords -

into effect. But by common consent the ratifications must include the so-called Quad group of the four biggest traders - the US, EU, Japan and Canada - plus a broad spread of smaller trading nations.

In the US, the lame-duck Congress will return for a special session to vote on the Uruguay Round implementing legislation after the November 8 mid-term elections.

In the EU, ratification has been delayed by a dispute over the powers of the executive

European Commission to speak for member states on all matters dealt with by the WTO. The European Court of Justice is due to pronounce on the issue on November 15, after which Brussels hopes rapidly to conclude the legislative formalities.

Meanwhile, in Japan last weekend's government decision to grant hefty compensation to rice farmers for ending the ban on rice imports has paved the way for ratification in the Diet.

### WORLD TRADE NEWS DIGEST

## Manila wants only top banks

Foreign banks that will be allowed into the Philippines under the country's liberalisation programme will be chosen from among the world's top 150 banks only, according to newly issued guidelines from the monetary authorities. A total of 31 foreign banks have signified interest in setting up shop in the country. Only 10 will be allowed to open full-service branches, although others may acquire up to 80 per cent of existing banks.

Mr Gabriel Singson, head of the central bank and its policy-setting Monetary Board, says the selection should be completed in early 1995. Under the law, six of the 10 banks will be selected by the Monetary Board, while the other four will be picked by the Philippine president. The full-service banks will be required to put up a minimum permanently assigned capital of 210m pesos (\$5.1m). They can open up to three branches in any location, and another three in areas to be designated by the Monetary Board. The guidelines provide that the home country of the applicant bank should extend "reciprocity rights" to Philippine banks. *Jose Galang, Manila*

## Spain and Germany talk tanks

Spain and Germany have begun talks on equipping the Spanish army with Leopard 2 tanks, potentially worth several hundred million dollars. Defence officials in Madrid emphasised yesterday, however, that the choice of a new tank to succeed US and French models was "not closed". Proposals under discussion between the two defence ministries would involve assembly in Spain and use of locally made components. This would require an agreement with the Leopard's manufacturer, Krauss-Maffei. The German company, controlled by the Mannesmann group, won a deal worth almost \$500m with Sweden earlier this year to supply 120 Leopard 2 tanks, with an option for 80 more. *David White, Madrid*

## Japan to curb pirate chips

Japan will strengthen controls on imports of semiconductors with illegally copied integrated circuits (ICs), officials at the Ministry of International Trade and Industry and the Finance Ministry said. The government has submitted a bill to parliament which would make it possible for a company claiming rights over the ICs to stop imports of semiconductors at customs. *Reuter, Tokyo*

## Railway planned for Tibet

Initial preparatory work has started on building a railway to Tibet, the only province or region of China not connected to the national network, the deputy chairman of Tibet's Planning Committee said. *Reuter Beijing*

## Contracts

■ Chantiers de l'Atlantique, shipbuilding subsidiary of GEC-Alsthom, has received an order from Royal Caribbean Cruises for two 1,000-cabin cruise ships. The order for the second ship is subject to confirmation before the end of May 1995. The ships will have diesel-electric propulsion systems. They are due to be delivered in April 1997 and April 1998. *Andrew Baxter, London*

■ Korean Air Lines said it has signed a contract with Airbus Industrie to supply fuselage panels for 400 Airbus A330/A340 aircraft from next year to 2002. The deal was valued at \$13m. KAL also won an Airbus contract in 1988 to supply panels for 600 aircraft, a company spokesman said. *Reuter, Seoul*

## Canada sends 400-strong trade mission to China

By Bernard Simon in Toronto

The rivalry among industrial countries to promote commercial ties with China will reach a new pitch next month when Mr Jean Chrétien, Canada's prime minister, leads a mission of almost 400 business leaders, politicians and officials to Beijing.

The mission's ambitious scope is partly designed to deflect business

criticism that Ottawa has been slower than many other western governments to recognise China's commercial potential. Canadian exports to China, totalling \$1.7bn (\$1.25bn) in 1993, have stagnated in recent years. But imports have risen rapidly, reaching \$3.1bn last year.

Companies represented on the mission range from banks, law firms and securities dealers, to metal produc-

ers, retailers and power utilities. Besides Mr Chrétien, the mission will include the premiers of nine of Canada's ten provinces. The only absentee will be Mr Jacques Parizeau, who heads the newly elected separatist government in Quebec.

The group will be in Beijing and Shanghai from November 6 to 10. It will also visit Hong Kong and Vietnam. According to one organiser, the

mission will be used to announce 35-40 trade and investment deals worth about \$51bn, all at an "advanced" stage of negotiations.

The two governments are expected to sign a nuclear co-operation agreement. Atomic Energy of Canada hopes the accord will be a "door-opener" for sales of its Candu heavy-water reactors.

There is also to be a progress

report on a venture between American Barrick Resources, the Toronto-based gold producer, Power Corporation, the Montreal investment holding company, and the China National Gold Corporation to accelerate development of the gold-mining industry. The Barrick-Power partnership has begun a pre-feasibility study of a deposit in Liaoning province, and is discussing further projects.

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## NEWS: THE AMERICAS

# Consumer confidence shows fresh dip in US

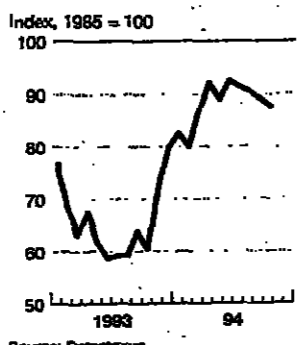
By George Graham in Washington

Consumer confidence weakened again this month while new data on employment costs showed wage inflation still very subdued, helping to offset the impression created by economic statistics last week that the US economy was about to accelerate again.

The Conference Board, a New York-based business organisation whose survey of consumer confidence is widely watched, said its index dropped this month by two points to 87.5 per cent. This is the fourth monthly drop in succession, but the board said the index had still fallen by a total of less than 5 points from its peak in June.

Mr Fabian Lindén, executive director of the board's consumer research centre, said the survey suggested "continued economic growth in the months ahead. Respondents to the survey said they were more worried about job prospects

## US consumer confidence



and less optimistic about their own financial situation than in previous months."

Although the decline in the confidence index has been modest, it was much larger than economic forecasters had anticipated, and served to dampen concern that the economy might again be showing signs of overheating. That concern was fuelled last week by strong housing starts data.

Data on sales of existing homes published yesterday showed more weakness, though sales still rose 1 per cent in September.

The Labour Department said its employment cost index rose by just 0.7 per cent in the July to September quarter, after rising 0.9 per cent in the second quarter and 0.8 per cent in the first. This left the annual rate of increase in employment costs stable at 3.3 per cent, the slowest rate since the index began in 1982 and arguably the slowest in the last 30 years.

Wages and salaries rose by 0.8 per cent in the third quarter, producing an annual increase of 2.9 per cent, but benefits, including health insurance, rose by 1.1 per cent in the quarter for an annual increase of 4.0 per cent.

The Labour Department said wage increases in major collective bargaining agreements signed in private industry during the July to September period averaged 1.9 per cent a year.

## Sanctions prove a thorny issue in US-Cuba talks

By Pascal Fletcher in Havana

Punitive sanctions slapped on Cuba by Washington in August have emerged as a point of contention in US-Cuban talks which opened in Havana on Monday.

The talks, which end today, are intended to review a 45-day-old bilateral immigration accord under which the US agreed to increase the number of US entry visas granted to Cubans each year to a minimum of 20,000. This is to be done through accelerated visa processing, expanded criteria for refugee status and a visa lottery to begin November 1.

Mr Dennis Hays, the US del-

egation leader, said restrictions on flights and dollar cash remittances to Cuba announced by President Clinton on August 20 were not part of the immigration issue. "They will not be dealt with at this time," he said.

Cuba took the opposite tack arguing that the August package of sanctions contravened the spirit of the bilateral immigration accord signed on September 9 in New York.

The US sanctions "have as much to do with the accord and immigration as the air that we breathe," said Mr Ricardo Alarcon, Cuba's chief negotiator. "If you want normal, orderly immigration, you

should not create obstacles to it," said Mr Alarcon, president of Cuba's national assembly.

Havana had hoped the immigration accord might lead to a wider dialogue on ways of solving the US-Cuba conflict.

Mr Clinton introduced the latest sanctions against Cuba in August after Cuba's President, Mr Fidel Castro, temporarily lifted restrictions on Cubans fleeing illegally in boats and flimsy rafts to the US.

Some 32,000 refugees, barred access to the US in a sudden change of policy by Washington, were sent to US bases in Guantánamo Bay in eastern Cuba and in Panama.



Mario Cuomo during earlier times at a Democratic Party convention in 1992

## Enemy camp aids Hamlet of the Hudson

Jurek Martin on Cuomo's battle to win a fourth term as New York state's governor



US MID-TERM ELECTIONS November 2

There is no patented single method of rising to the top of politics in New York, city and state. Name and money help (FDR, Harriman and Rockefeller were all governors) as do sheer chutzpah (exemplified by La Guardia and Koch as mayors) and brains (Senator Daniel Moynihan). But most of the time there is no substitute for a sheer sense of larger-than-life drama. Not for nothing is Mr Mario Cuomo, the Democratic governor in pursuit of a fourth term, known as the Hamlet of the Hudson for his musings on the meaning of life and his own career.

There is now, indisputably, a pretender to that title and a new leading man on the state stage. The only question is whether Mr Rudolph Giuliani, the popular Republican mayor of New York City who endorsed the unpopular Mr Cuomo on Monday afternoon, will come to be seen as a Fortinbras, who inherited Denmark after Hamlet, or as a scheming Iago with his own agenda.

There are two important sub-plots in Mr Giuliani's decision. The most obvious centres on the bitter enmity between the mayor and Mr Al D'Amato, the Republican senator from New York whose hand-picked candidate, the hitherto obscure Mr George Pataki, is ahead of Mr Cuomo in the governor's race. In 1989, Mr Giuliani blamed his narrow defeat for mayor by Mr David Dinkins on the senator's backing of another conservative candidate.

Stemming from that, and advanced both by Mr Giuliani and by a relieved New York Times editorial yesterday, is the mayor's calculation his perennially financially strapped city would receive more sympathetic treatment from Mr Cuomo than it would from a Governor Pataki whose campaign message is to lower both taxes and spending.

The Giuliani assessment was concisely expressed. He said Mr Cuomo, who has increased state funding for the city, loved and understood it and did not make promises he could not fulfil.

In contrast Mr Pataki had "almost uniformly voted against the interests of the city and often the metropolitan region."

But most telling, and most aimed at Senator D'Amato and Mr Pataki, sometimes scathingly labelled *Cepetto* and *Pinocchio*, were the words: "Mario Cuomo is his own man. I prefer dealing with someone who is his own man, even if we disagree on some important issues."

Democratic joy at the Giuliani endorsement knew no bounds. Mr Cuomo described his decision, natu-

rally, as "extremely intelligent and courageous." President Bill Clinton called the mayor from Cleveland to express his appreciation. Republican fury, replete with allegations of treachery, was of a comparable scale. Mr D'Amato declared: "Rudy Giuliani is wrong."

Clearly, much depends on whether or not the Giuliani seal of approval rescues Mr Cuomo. The New York Post poll yesterday gave Mr Pataki a 44-36 point lead, with 11 per cent undecided and nearly 7 per cent going for Mr Thomas Golisano, a conservative pro-life independent candidate.

The rough rule of thumb is the governor needs about two-thirds of the city vote to offset the Pataki advantage in conservative upstate areas. Mr Giuliani's popularity in his bailiwick should help. One poll found 11 per cent of the city inclined to follow his recommendation.

The mayor has seemed for some time to be edging towards a Cuomo endorsement, frequently appearing with him at nationally non-political events. He had met the Republican candidate only once in the campaign, and reported coolly on their discussion, yet he was more complimentary after longer sessions with Mr Golisano, who is competing for the same votes on the right as Mr Pataki.

On the other hand, Mr Cuomo, along with Senator Edward Kennedy of Massachusetts the nation's most promi-

nent liberal Democrat, has appeared very vulnerable. Not only was the conservative anti-incumbent tide washing against him, but the length of his tenure and his persistent refusal to take a national job on the Supreme Court or in the Clinton cabinet left many New Yorkers with the impression he would have to be wrangled out of office.

But the inevitable, though not necessarily accurate, talk of the town yesterday was as much on the mayor's ambitions beyond his city. With Senator Moynihan certain of re-election on November 8, the next state-wide openings are 4 years away in the next governorship race and Mr D'Amato's seat.

It would be easier for the mayor to succeed Mr Cuomo after 16 years than Mr Pataki after four. A race against Mr D'Amato would whet every appetite for political blood, but the Senator's control of the state Republican party is such that challenging him in a primary would be tough. But the trend of the times favours independent candidates and the mayor has, at a stroke, shown independence from his own party.

No mayor of New York this century has won higher elective office, though several have tried. Thus Mr Giuliani's statement on Monday can also be taken at face value - that he was not thinking about himself but following his own intuitions and sense of what was best for New York.

## Mexico warning over California

By Damien Fraser in Mexico City

Mr Manuel Tello, Mexico's foreign minister, has warned that approval by the state of California of a proposal to curb illegal immigrants' access to education and healthcare would damage US-Mexican relations.

Mr Tello urged that proposition 187 - known as save our state - be rejected when it comes up for vote in the state on November 8. He indicated Mexico would back a constitutional challenge to the proposition were it approved by Californian voters.

The proposition, which appears from opinion polls to enjoy the support of a majority of Californians, would deny education and non-emergency healthcare to illegal immigrants and their families. It has caused a furore in Mexico, the main source of illegal immigration to the US. Some border cities have sought to boycott US goods in protest at the measure.

Mr Tello said the proposition would "contaminate" bilateral relations along the border. He said trying to deny basic services to the children of undocumented immigrants would create the figure of a "big brother that is watching over you."

Mexico's ambassador to the US, Mr Jorge Montano, voiced similar concerns.

## Local version of privatisation planned in wake of stabilisation success

# Bolivia's way to shed state sector

By Stephen Fidler, Latin America Editor

In government offices in the centre of La Paz, the lights are burning late. Fifteen months into the four-year presidency of Mr Gonzalo Sanchez de Losada, officials are working furiously on the details of a project they hope will change the shape of the Bolivian economy.

The project aims at transferring to the private sector state enterprises together responsible for about one-eighth of economic activity.

The process is not being called privatisation. Opinion polls, says Mr Edgar Saravia, a senior government official, showed that Bolivians associate privatisation with a loss of national sovereignty and corruption.

The Bolivian version - called capitalisation - aims to skirt these perceived objections. It proposes bringing in foreign investors to take a strategic equity stake in the six enterprises, and then a distribution of up to 50 per cent of the remaining shares to the estimated 3.8m adult Bolivians. These shares will be placed in special pension accounts to be drawn on an annuity basis when the holders turn 60.

For a country where only 350,000 people - 5 per cent of the population - have bank accounts, this is an ambitious undertaking. But the government believes it necessary to lift economic growth to levels which will start to have an impact on poverty. The country is the poorest in the west-

ern hemisphere after Haiti and, according to the World Bank, about 70 per cent of the population are poor - living on less than a dollar a day.

Bolivia was one of the first countries in Latin America to introduce a successful economic stabilisation plan to bring down inflation. In 1985, while planning minister, Mr Sanchez de Losada introduced the programme to attack annual inflation of over 23,000 per cent. Inflation has come down - to a forecast 6.8-7.3 per cent this year from 9.1 per cent last. But growth, while mostly positive - it should reach 4.5 per cent this year - has not been enough to affect poverty levels.

Unlike most of its regional neighbours, Bolivia failed to follow its stabilisation plan with privatisations and other reforms of its economic structure.

This has meant the government reasons, inadequate investment and therefore slow growth. Public sector investment at 9 per cent of GDP has been higher than in most Latin American economies. But according to a World Bank report completed this month: "For the most part, these public resources have been misallocated and invested inefficiently." Private sector investment has been running at a weak 5 per cent of GDP.

The aim is to use capitalisation to develop the productive and export potential, particularly of the energy and mining sectors, and to triple private sector investment. With public investment falling to around 5



Sanchez de Losada: 'all bets'

per cent, the overall investment rate of 20 per cent or more should help to accelerate growth.

There are difficulties with the capitalisation approach. Unlike in a privatisation where government revenues are boosted in the initial years, capitalisation implies short-term costs for the government, because it receives no revenues. This and other reforms will boost the budget deficit next year and in 1996.

According to an agreement signed in Washington last week with the International Monetary Fund, the deficit will widen to 4.4 per cent of GDP next year, from an estimated 3.3 per cent this year, and in 1996 it will widen further.

The government hopes that the sales of the stakes to strategic investors will be completed by July next year. To be capitalised are:

- YPFB, the state oil company, which accounts for about 9 per cent of GDP. Its greatest resources are gas rather than oil, output of which has been falling slowly since the 1970s. The company's valuation will be boosted substantially - perhaps by two to three times - if potential investors perceive that preliminary agreements to export gas to northern Chile and Brazil will come to fruition soon. It could receive a capital injection of more than \$1bn, according to some private estimates.

- Entel, the long-distance telephone carrier. It connects 280,000 telephone lines - most run by regionally-based co-operatives. This could, the government estimates, rise to more than 1m by the year 2003. Revenues have grown 70 per cent in the past five years to \$101m last year.

- ENDE, the state electricity company, and the first to be capitalised. It generates more than a half of Bolivia's electricity. The country's market is small - currently there is 760MW of installed capacity - but it is hoped that the possibility of generating electricity to the country's neighbours will entice investors.

- ENFE, the state railway company. It could be split into three or left as a single entity. The government may leave it open to allow bidders for one, two or three entities. The lines are likely to remain formally in state hands and handed over to 99-year concessions to the operating companies.

- LAB, the state-run airline. This is not going to be the eas-

est capitalisation: a seminar to orientate potential investors was cancelled when only three showed interest in turning up.

- ENAF, smelters and associated mines. This is essentially what is left of the Bolivian state mining operations that once dominated the economy. The aim is to capitalise the smelters and offer leases on associated mines, which cannot be sold without changing the constitution.

After promising an early start to capitalisation, Mr Sanchez de Losada got bogged down with other legislation. An overall capitalisation law was passed, but six more important pieces of legislation are needed for privatisation, including a law establishing a regulatory system for the companies, electricity, telecommunications, and hydrocarbons laws, a tax reform law, and a revised mining code.

Despite trouble this month with his governing coalition, the US-educated president appears to have secured for himself the necessary majority in both houses of Congress to pass the legislation. There is a lot riding on capitalisation, and the president knows it. "All my bets are placed on it. I'm a goner if it doesn't work," he said in an interview last week.

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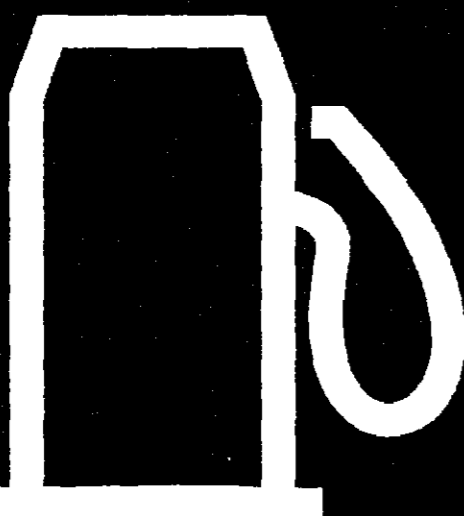
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# Southern Africa eyes prize of peace

If the 60m people of southern Africa were capable of collectively crossing their fingers, and uttering a silent prayer, they would be doing so this week.

The outcome of Mozambique's elections and Angola's peace talks will determine whether the region can, for the first time in three decades, secure peace.

Here, in the two countries where the old southern Africa was born some 400 years ago, the final stages in the shaping of the new southern Africa are taking place.

It was on the coasts of Angola and Mozambique that the Portuguese seafarers Vasco da Gama and Bartolomeu Dias laid claim to an African empire which was to last until 1974. That year the foundations of white rule began to crack, for the coup in Lisbon in 1974 not only paved the way to independence for Portugal's African colonies, it marked the beginning of the end for minority regimes in Rhodesia and South Africa. The days ahead now see the final phase of that process, which has been hastened by the collapse of communism and the end of superpower rivalries.

In Mozambique, 6.5m voters go to the polls tomorrow and Friday in the country's first multi-party elections. If they proceed without mishap, the country can begin to develop an economy shattered by civil conflict and external aggression.

In Angola, talks aimed at bringing an end to the civil war may be within reach of success, according to Mr Boutros Boutros Ghali, United Nations secretary-general.

Should Mr Jonas Savimbi, the Unita leader who forced the collapse of the 1991 settlement when he refused to accept his defeat by President Eduardo dos Santos in the election the following year, agree to the terms negotiated over the past nine months in the Zambian capital Lusaka, the last piece of the regional settlement falls into place.

And if both Mozambique and Angola manage to secure a lasting peace in the critical days ahead, it would mark a watershed for the region, led today by newly democratic South Africa.

## The events that shaped a new southern Africa

1974 Portugal's dictatorship ousted. 1975 Portugal cedes independence to colonies, including Angola and Mozambique, where guerrillas were begun in early 1960s. Portuguese flee, and civil wars break out. South African troops invade Angola. Cuba begins troop build-up.

1976 Mozambique's chess board with Rhodesia, where white minority had unilaterally declared independence from Britain in 1965.

1978 Guerrilla war in Rhodesia escalates as forces led by Robert Mugabe and Joshua Nkomo infiltrate from bases in Mozambique and Zambia.

1979 Lancaster House settlement on Rhodesia paves way for the independent state of Zimbabwe. Elections in 1980 won by Mugabe's Zanu party.

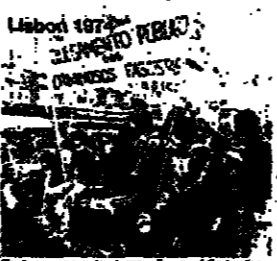
1985 US-brokered deal secures independence for Namibia from South Africa in return for Cuban troop withdrawal from neighbouring Angola.

1986 Sam Nujoma, leader of South West African People's Organisation, wins Namibia's independence election.

1989 South Africa releases long-imprisoned black nationalist leader Nelson Mandela.

1991 Cassafra in Angola civil war. 1992 Angolan elections confirm President Eduardo dos Santos' MPLA in power, but opposition Unita leader Jonas Savimbi refuses to accept outcome. Civil war resumes.

1992 Cassafra in Mozambique civil war. 1994 Mandela's African National Congress wins first all-race elections in South Africa.



**Angola**  
The 1974 military takeover in Portugal brought Angolan independence the following year, but not peace. Civil war, continued, exacerbated by South African invasions and the arrival of Cuban troops. A ceasefire resulted in elections in 1992, with the ruling MPLA defeating the opposition Unita movement. Unita refused to accept the outcome, war resumed. Now, peace talks may be close to success.

**Zimbabwe**  
Once the field of the British South Africa Company, the territory (then Rhodesia) became a British colony at the end of the century. The settlers' white government in 1965, unilaterally declared independence in 1965, but bowed to worldwide and guerrilla war in 1979. In 1980 elections, the Zanu party came to power, where it stays today in partnership with the Zupu party.

**Mozambique**  
As in Angola, independence in 1975 was traumatic, marked by the exodus of more than 200,000 settlers of Portuguese origin and a civil war encouraged first by white Rhodesia (now Zimbabwe) and then by white South Africa. A 1992 peace pact brought the war to an end. This Thursday and Friday, 6.5m voters go to the polls in the country's first multi-party elections.

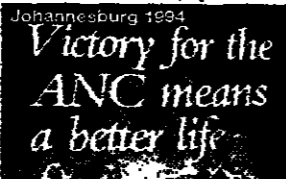
**South Africa**  
More than 350 years after Dutch explorer Jan van Riebeeck founded a settlement at the Cape of Good Hope, white rule and its apartheid racial policies finally gave way in the face of sanctions and domestic opposition with the release from prison in 1990 of Nelson Mandela. He was elected president of South Africa this year in the country's first all-race elections.

**Namibia**  
A 1986 US-brokered settlement saw the withdrawal of Cuban troops from Angola in return for South African acceptance of multi-party elections in Namibia. These took place in the following year and were won by the South West African People's Organisation, which is still in power.

**Secretary-general's optimism**  
is not shared by the people in Lusaka. "If the two sides show the necessary political will, the outstanding issues can be resolved within a short time", Mr Boutros Ghali said recently, and urged the Angolan government and Unita to conclude the peace talks by October 31. Should a final deal be struck, it would involve a revival of previous accords in 1981. But the collapse of the transition in late 1993 inspired new hatreds.

The Unita fighters used hidden weapons stockpiles rapidly to capture much of Angola's territory, while in the main towns and cities MPLA vigilantes hunted down and killed Unita supporters.

The renewed distrust will make disarmament of both sides, envisaged under the new peace plan, a difficult exercise. The two sides do agree that Angola needs a UN force at least 6,000 strong to oversee a ceasefire. Both government and Unita officials are doubtful, however, about the world's



Victory for the ANC means a better life

Free of racial division and civil war, without external aggressors, and accepting the principles of democracy and civil rights, and with market driven economic planning, southern Africa will have a common cause: to develop the potential of lands rich in oil and natural gas, minerals, marine resources and agricultural produce, with the bonus of thousands of miles of fine beaches encompassing Africa's finest wildlife reserves.

But although the foundations of the new region are in place, much can yet go wrong before the office is finally complete.

In Mozambique Mr Afonso Dhlakama, leader of the erstwhile rebel Renamo party and the main challenger to President Joaquim Chissano's ruling Frelimo party, seems to be hinting that he, like Mr Savimbi, might not accept defeat at the polls.

Meanwhile peace may yet prove elusive in Angola, notwithstanding the optimism of Mr Boutros Ghali, who in his

report to the Security Council said that "the peace talks are now in their final phase".

The collapse of Angola's transition to democracy is fresh in the minds of the Mozambique electorate. Mr Chissano, whose party has ruled Mozambique since independence, is widely expected to win, but made clear that Mr Dhlakama would be part of a coalition government only on

terms, unconditionally accepting Frelimo policies.

The differences between the two parties are not ideological, however, but stem from regional, ethnic and personal rivalries.

"First we are asking whether Mr Dhlakama will accept my programme with no preconditions," said the president. "I think it is necessary to have opposition, but in parliament, not in the administra-

tion... Renamo is not an opposition in ideological terms."

Some observers suspect that Mr Dhlakama is preparing the way for a return to the bush war. He has repeated recent warnings that Renamo would not tolerate electoral fraud in the presidential and parliamentary polls.

Unlike Angola, however, the integration of rival armies is more advanced and the UN

monitoring force is 7,000 strong - nearly 10 times the Angola contingent - and is backed by 2,400 international observers.

Both sides, however, are thought to have substantial arms caches and to have kept back soldiers in reserve. Whichever party wins the elections, only a coalition government can effectively tackle the legacy of 400 years of colonialism and 30 years of war.

Meanwhile in Angola the UN

## As Mozambique and Angola edge warily toward a lasting peace, Michael Holman, Nicholas Shaxton and Peter Stanley assess the likely impact on the region

### INTERNATIONAL NEWS DIGEST

## Japan scandal sentence passed

A former provincial governor, the only Japanese politician brought to trial in a bribery scandal involving the Sagawa Kyubin parcel delivery company, yesterday received a suspended prison sentence. Mr Kiyoshi Kaneko was given a one-year jail term suspended for three years, for taking ¥100m (\$1m) from Sagawa Kyubin in a political funding scandal that helped bring down two governments.

Disclosures over Sagawa Kyubin's donations to senior politicians in 1992 and 1993 contributed to the collapse of the Liberal Democratic party government last year. Suspicions over Sagawa Kyubin funding caused the resignation of Mr Morihiro Hosokawa, prime minister of the succeeding coalition government, last April.

Mr Ryutaro Hashimoto, international trade and industry minister, had not deviated from the cabinet's stance when he told a parliamentary committee on Monday that the question of whether Japan committed aggression against Asian neighbours was "a delicate matter of definitions." Mr Kozo Igarashi, Japanese government spokesman, said yesterday.

Mr Hashimoto, also chairman of the Japan War Bereaved Families Association, acknowledged Japan invaded China and imposed colonial rule on Korea, but claimed Japan's Second World War fight was not with Asian nations but with the US and European powers. William Dawkins and Reuter, Tokyo

### MCI in Mideast telecoms deal

The US telecommunications giant MCI said yesterday it had signed a contractual agreement with Patelco, a private company with the telecommunications concession for the Gaza Strip and West Bank, to provide international telephone network capacity. The MCI statement, made after a ceremony in Gaza yesterday which marked the transfer of the telecommunications network from the Israeli state-owned telecom company to Patelco, comes amid growing international controversy about the award of the contract. Mr Lawrence Kodacovi, senior vice-president of MCI, said Patelco would run and operate the telecommunications system in all Palestinian areas and MCI would provide the network capacity to link the Palestinian areas with the rest of the world. The US has formally complained to Mr Yasser Arafat, Palestine Liberation Organisation chairman, about the absence of open public bidding for the telecoms contract. Julian O'Connell, Jerusalem

### Migrant trafficking on increase

Trafficking in migrants is on the increase and now accounts for the bulk of illegal immigrants into the world's rich nations, according to the International Organisation for Migration. It estimates that traffickers pocket hundreds of millions of dollars each year from several hundred thousand migrants seeking a better life overseas. Payments can reach \$30,000, the going rate paid by Chinese to gangs for entry to North America and western Europe. Frances Williams, Geneva

### S Africa trade surplus falls

South Africa's trade surplus fell in September to just R168m (\$48m), precipitating a sharp rise in local bond yields. Imports dropped slightly to R7.4bn from August's R8.1bn, while exports fell even more sharply to R7.6bn from R8.4bn, bringing the total trade surplus so far this year to R10.6bn, well down on R14.5bn for the same nine months in 1993. Mark Szarmen, Johannesburg

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## NEWS: UK

# Investigator says premier ruled out deal

By James Blitz

The prime minister yesterday published a report by Sir Robin Butler, secretary to the cabinet, after an investigation into allegations of impropriety against members of the government brought by Mr Mohamed Fayed, the chairman of Harrods.

In the report Sir Robin said that he was asked to investigate the allegations on September 30, one day after they had been brought to Mr John Major by an informant.

According to Sir Robin, the informant said the Harrods chief had sought a meeting with the prime minister "principally because of Mr Fayed's wish to have the Department of Trade and Industry inspectors' report on the takeover of the House of Fraser revised or withdrawn".

The report said: "He had made a number of allegations against government ministers and was contemplating passing them to others." The prime minister told Sir Robin that it would be impossible for him to meet Mr Fayed. Mr Major said he would not make any deal with the Harrods chief - "regardless of the cost to the government's reputation".

On October 3, the prime minister instructed Sir Robin to

follow up all the allegations with the ministers concerned.

Sir Robin had "conversations" with the ministers the week before the Conservative party conference. On Monday October 17, after his return from Bournemouth, Mr Major concluded that he should accept the resignation of Mr Tim Smith, the junior Northern Ireland minister, at the end of the week once Sir Robin had completed his inquiries.

However, before this happened, allegations that Mr Smith and Mr Neil Hamilton, the corporate affairs minister, were paid to raise questions in the Commons on Mr Fayed's behalf were published in The Guardian newspaper.

Mr Smith told Sir Robin that he received payments from Mr Fayed between 1987 and 1989 without declaring the information in the Register of Members' Interests until just before the end of that period.

The report said: "He acknowledged that he should have done so earlier."

According to Sir Robin, Mr Hamilton emphatically denied throughout his inquiries that he had received any payments deriving from Mr Fayed.

"I have found no evidence which controverts Mr Hamilton's assurances on these matters," Sir Robin wrote.



Martin Ballinger, managing director of Go-Ahead Group, a private bus operator, outside St Paul's Cathedral celebrating Go-Ahead's purchase for nearly £24m (\$37.5m) of the publicly owned London Central bus company. Six of the 10 London bus companies have been sold in the past two months

## CBI finds growing price pressure

By Philip Coggan, Economics Correspondent

Manufacturers are enjoying a surge in exports but plan to increase prices in the face of rising costs according to the latest quarterly survey of industrial trends from the Confederation of British Industry, the largest employers' organisation.

The survey showed that more manufacturers were planning to increase domestic prices in the next four months than at any time since January 1991.

The CBI survey also found that: ● Business optimism increased over the quarter. ● Investment intentions improved, with the number of companies planning to invest in new plant and equipment reaching its highest level since April 1989.

● Fewer jobs are being lost than at any time since October 1989.

While the signs of an export-led recovery and higher manufacturing investment may be welcome to the government, the news of potential inflationary pressures raised fears that further interest rate increases might be announced this year.

The CBI's findings on price expectations were one of the factors cited by Mr Kenneth Clarke, chancellor of the Exchequer, and Mr Eddie George, governor of the Bank of England (the central bank), when they increased base rates last month.

CBI surveys deduct the proportion of those expecting a factor to decline from those expecting it to increase, and express the result as a percentage balance.

The balance of companies expecting to raise prices in the next four months was 20 per cent, up from 12 per cent in the last quarterly survey and 15 per cent in the CBI's monthly trends report in September.

The survey showed that a balance of 9 per cent of companies increased domestic prices in the past four months - the highest since early 1991.

## Deadline is set for Maxwell pension payouts

By Norma Cohen, Investments Correspondent

International investment banks and advisers to the pension schemes formerly controlled by Robert Maxwell have been given until November 4 to make an offer of restitution.

Sir Peter Webster, the former High Court judge appointed to help find a "global solution" to the shortfall in Maxwell pension scheme assets, met trustees and advisers to most of the schemes yesterday. Sir Peter hoped the global solution would raise "several hundred" million pounds, enough to enable each scheme to meet its liabilities in full.

Sir Peter is understood to have told the investment banks that he will not accept offers which are not "reasonable" both in relation to the amount sought by pension schemes and in relation to contributions that would be offered by other participants.

Trustees yesterday asked Sir Peter to set a deadline for completion of a final

settlement, hopefully before the end of the year.

Sir Peter has been working since last spring to find ways to allow investment banks and advisers which may have assisted in the disappearance of assets from the schemes to make restitution without incurring the embarrassment of admitting doing wrong.

Firms which do not make reasonable offers of restitution by November 4 risk legal action by the pension schemes. It is understood that several schemes have prepared writs, which have not yet been served, seeking millions of pounds.

Sir Peter is understood to have told trustees that participants in the global solution are likely to set conditions on their contributions.

In particular, they will seek confidentiality and a guarantee that no further claims be made against them. Also, they may seek assurances that counter-claims from other investment banks will also be dropped.

## Most life houses welcome SIB plan

The leading life companies yesterday broadly welcomed the Securities and Investments Board's two-year blueprint for helping victims of pension mis-selling - except for Legal and General which attacked the scheme. Jim Kelly writes.

Mr David Prosser, chief executive of Legal and General Group, said: "We believe that the SIB is unfairly putting too great a burden on the costs of resolving the issue on the life assurance industry... This is a pensions industry problem which should have been funded by the whole of the pensions industry."

Mr Prosser said the additional provisions Legal and General will have to make

under the scheme would be within the financial capacity of the company.

Mr Geoffrey Lister, chief executive of the Bradford and Bingley Building Society, said the problem revealed by the SIB report was surprisingly large and many smaller advisers might be forced out of business.

He said: "I hope that SIB is supported in its suggestion that occupational pension schemes will be reasonable in their demands when it comes to reinstating transfers and opt-outs."

"Otherwise I fear the IFA [Independent financial adviser] sector will become solely the preserve of larger organisations like ourselves."

## Old dispute entangles Rowland and Fayed

By Robert Peston

The complicated relationship between Mr Mohamed Fayed and Mr Tiny Rowland - once friends, then enemies, now allegedly buddies - took an extraordinary twist yesterday when it emerged that they are in effect suing each other again.

They find themselves at opposite ends of a court case because of an indemnity which Mr Rowland's company, Lornho, gave to Mr Graham Jones, a former employee of Mr Fayed who defected to Lornho.

Because of this indemnity, a potentially substantial liability may have been created for Lornho by legal proceedings which Mr Fayed initiated at the beginning of the year for breach of confidence against Mr Jones, former finance director of House of Fraser, the stores group which was acquired by the Fayed in 1988. Mr Jones is defending the action.

Mr Rowland last night confirmed the existence of the indemnity, but said that he did not believe Mr Fayed would do anything to damage him.

Mr Royston Webb, Mr Fayed's legal adviser, said that in the forthcoming case he would be contesting the validity of the indemnity. He said that there was precedent that such an indemnity was void if wrongdoing was proved.

Mr Michael Cole, a colleague of Mr Fayed, said Mr Fayed and Mr Rowland "currently love each other", so he did not believe Mr Fayed would pursue the case if it hurt Mr Rowland. Until peace broke out last October, Lornho and the Fayed had been warring in and out of court for eight

years, because of Mr Rowland's fury that the Fayed had snatched House of Fraser from under his nose.

As part of his campaign to destabilise the Fayed, Mr Rowland had allegedly secretly recruited Mr Jones in the spring of 1990. Mr Jones had left House of Fraser in January of that year and had allegedly undertaken not to divulge confidential information. Mr Jones allegedly received payments of \$558,000 from Lornho between April 1990 and June 1991. During that period, he allegedly supplied information to the

Bank of England alleging that the Fayed were not fit to own Harrods Bank.

The Bank took action against the Fayed and in June 1991 it forced them to surrender their management control of Harrods Bank to an independent trustee. Mr Fayed was furious. He had long suspected that Mr Jones had worked with Lornho but could not prove it.

After Mr Fayed and Mr Rowland agreed to drop their court cases against each other, he asked Mr Rowland for documentary evidence on Lornho's relationship with Mr Jones.

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## UK NEWS DIGEST

## Engineers move nearer to deal on single lobby

An initiative to create a single voice for the engineering industry was announced by Sir John Fairclough, chairman of the 13-year-old Engineering Council. He unveiled a proposal to create a new body to bring together the views of the institutions, industry and academics and provide the long-awaited "single voice" for the profession.

Sir John's attempts to create a new structure have been strongly supported by industrialists and by Mr Michael Heseltine, trade and industry secretary, who believes a more unified structure would raise engineers' profile and simplify relations with the government.

The council is the federal body for 41 professional institutions, but many engineers believe it has failed to provide an effective voice for the profession. Large institutions have also been wary of conceding it too much power. After several months of discussions by a policy group set up in September last year, the breakthrough came with the development of a proposal for a democratically-elected "senate" to be the focal point for the profession. The senate would have two boards, one to promote the profession, and the other to promote it.

## Warning on trade conflict

The world's main trading nations should rise above politics in picking a leader for the World Trade Organisation, Professor Jagdish Bhagwati of New York's Columbia University said in London last night at a memorial lecture for Harold Wincott, the former Financial Times journalist. Prof Bhagwati, an international trade economist and former economic policy advisor to GATT, said that the new WTO faced a historic challenge in finding solutions to new sources of world trading conflict.

Forecast among these would be the environment, labour standards and international competition policy. He said in the 24th annual Wincott lecture that the WTO would require "intellectual leadership, not the skills of political fixmanship." "Instead," he continued, "we observe the main trading nations battle to put their man in Geneva. It seems that their chief desire is to pursue their narrow political advantage, and advance their preferred economic agenda."

## Research on 'jobs' in schools

Better ways need to be found to control the "job element" creating uproar in classrooms, said Mr Chris Woodhead, chief inspector of schools. It was no answer to expel disruptive pupils, leaving them to roam the streets. He said his organisation, the Office for Standards in Education (Ofsted), would examine methods used by schools which succeeded in handling disruptive pupils without expelling them.

Mr Woodhead spoke after Ofsted reports indicated a rising number of expulsions and suspensions from schools. Reports on 10 per cent of schools for pupils aged 11 or more showed that almost 900 pupils were expelled permanently from schools in England last year. One in eight schools expelled five or more pupils. Some 1,178 pupils were suspended indefinitely and nearly 10,000 were ordered out of schools for fixed periods. "If this is a rising trend, it is something we must all be worried about," said Mr Woodhead.

## Channel train delayed again

The Eurostar Channel tunnel rail network yesterday suffered its second delay on a trip arranged so that a trainload of invited guests could sample its service to the Continent. The train heading from London to Brussels was delayed for 10 minutes in the tunnel because it had to be diverted from one track to another after a signal fault.

A similar trip to Paris last week opened with the train breaking down at London Waterloo and passengers being transferred to a replacement after an hour's delay. Mr Malcolm Southgate, deputy managing director of European Passenger Services, said: "This was nothing serious, but it did slow us down a bit." European Passenger Services - the UK arm of Eurostar - explained that the signalling fault was a problem for Eurotunnel, the tunnel operator.

## Crowds flock to Pulp Fiction

Quentin Tarantino's film Pulp Fiction, winner of the Palme d'Or at Cannes this year, has taken more than \$700,000 (£1.1m) at 190 UK cinemas during its first weekend. Buena Vista International, the distributor, said. The film starring John Travolta and Bruce Willis has topped the US box office for the past two weeks. The film has been greeted by many British critics as brilliant, but unusually disturbing. Tarantino's Reservoir Dogs has returned to UK cinemas after months of being barred from distribution on home video tapes.

Tarantino's True Romance has, however, been cleared for video release in the UK in December after becoming embroiled in a long public debate about the effect of violent films in the wake of the murder in Liverpool of two-year-old James Bulger. Evidence was given at the trial of the boys convicted of killing him that they had been influenced by watching a film called Childs Play 3.

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## Salmon survives long journey

A salmon tagged by scientists on the River Dee in Wales a year ago has been caught more than 1,000km away in Denmark. Mr Henning Pedersen landed it while fishing in Jutland and qualified for a reward of £5 (£7.50) from the UK's National Rivers Authority. Mr Ian Davidson, a scientist at the authority, said: "A salmon recaptured outside the British Isles is exceptional, and a first for our current programme of tagging on the river."

The fish was one of nearly 1,300 fish fitted with a coded plastic tag at a weir in Chester, north-west England, in October last year as part of research to monitor the progress of salmon and stocks in the Dee. About 20 per cent were caught by local anglers and others were recovered from neighbouring rivers. Scientists do not know how one fish survived as far as Denmark. "The mystery remains whether it was a Dee fish which went completely off course, or whether it was originally a Danish fish that somehow found its way to Wales and then returned to Denmark," said a scientist.

## MPs point to cancer risk from petrol

By Charles Batchelor, Transport Correspondent

An all-party committee of MPs and the UK oil industry yesterday became embroiled in a fierce argument over whether unleaded petrol poses more of a threat to health than the leaded petrol it set out to replace.

The row broke out after the House of Commons transport committee called for a ban on the sale of super-unleaded petrol and a government review of "premium" unleaded after scientific evidence showed it to be more likely to cause cancer than leaded fuel.

The MPs' findings, contained

in a report into air pollution in London, overturn many popular assumptions about the use of "green" petrol. Their report came on the eve of the publication of an in-depth study of the impact of the car on the environment by the Royal Commission on Environmental Pollution.

Many motorists using unleaded petrol would be shocked to learn "they are chucking out greater quantities of pollutants than an old banger," the transport committee commented.

It said: "Sales of unleaded petrol have been encouraged by aggressive promotion campaigns emphasising its 'green'

credentials but without making the crucial distinction between its use with and without a converter. The result is a huge gap between public perception and reality."

The UK Petroleum Industry Association, representing 15 large oil companies, denied there was any justification for banning super-unleaded petrol. Unleaded petrol had been introduced in response to a government request to reduce lead in the atmosphere, it said.

Apart from the lead content there was no significant difference between the composition of unleaded petrol and four-star leaded petrol. Aromatics such as benzene, blamed for

causing cancer, had not been added to replace the lead, the association said.

It also denied that oil companies were involved in the "aggressive" marketing of unleaded fuels. The industry would be delighted to co-operate in any government investigation, but research was already under way into the polluting effects of a wide range of fuel blends.

The MPs urged that super-unleaded, used in high-performance engines and accounting for 5 per cent of motor fuel sales, should be phased out by the end of 1996. They called on the government to investigate the use of unleaded petrol in

cars without catalytic converters.

Mr Brian Mawhinney, transport secretary, and Mr John Gummer, environment secretary, expressed surprise at the report and said benzene levels in London were at or below recommended levels.

The British Medical Association, which represents family doctors, said the report suggested only "minor technical fixes" and ignored the need to reduce car travel by investing in alternatives.

The report made 35 recommendations on improving air quality including tougher emission standards as part of vehicle tests.

## Second Forth bridge is opposed

By James Buxton, Scottish Correspondent

The government was urged yesterday to postpone for five years a decision on building a road bridge over the Firth of Forth near Edinburgh, the Scottish capital. It was advised instead to raise tolls on the existing road bridge in order to finance transport improvements which might make a second road bridge unnecessary.

The proposal came from Lothian Regional Council, which covers the area on the south side of the Firth of Forth, in response to studies published by the government which present a strong case for a second bridge. The government is expected to announce before the end of the year that it wants to go ahead with the project, which would be financed by the private sector.

The regional council acknowledged yesterday that severe traffic problems at the bridge would increase if nothing was done. It proposed increasing tolls on the existing bridge from 40p per car each way to £1.50 (£3.37) as soon as consent could be obtained from parliament.

The increase would help reduce unnecessary traffic on the bridge and yield £35m a year to municipal authorities and the government's Scottish Office. Of this, £20m would go to fund improvements in public transport and road links.

Extra money would be invested in the railway system to boost the number of trips made across the Forth railway bridge.

## Retreat is forced by Conservatives who represent areas with threatened authorities

## Government drops plan to scrap councils

By John Authers

The government yesterday abandoned its plans to abolish North Yorkshire and Somerset county councils after pressure from Conservative MPs.

The Local Government Commission had recommended that both counties should be replaced by councils combining the powers now held by districts and county authorities.

The move was the latest twist in a long series of government attempts to secure a satisfactory reform of local government.

The process began in 1974 when many of the old counties dating back to Anglo-Saxon times were abolished in a radical redrawing of the administrative map.

The commission was set up by the present government in 1991 to meet some of the criticisms

## Painful path to municipal reform

1991: Government raises prospect of ending traditional two-tier system in which large county councils and smaller district councils hold different powers over the same areas

1993 May: Review commission's first recommendations involve abolishing several county councils

1993 July: John Major voices proposal by environment minister John Gummer to abolish the review for all counties and send the commission only to counties where a majority request it

1993 Oct: Gummer announces changed guidance to the commission: retaining existing two-tier administration is now to be the "exception" rather than the rule

1994 Jan: Lancashire county council, threatened with abolition, wins court judgement that Gummer's "exception" rule is unlawful

1994 summer: Commission suggests abolishing several county councils and handing their powers to enlarged district authorities; launches local "advisory reference"

1994 October: Referenda show widespread opposition to administration by enlarged district councils

of the 1974 structure. The commission hinted yesterday that there would be a further climbdown from radical reform today, when it will submit proposals on nine more counties to Mr John Gummer, the environment secretary. It is expected to recommend no change in six counties.

However, Mr Gummer told parliament yesterday that Avon and Humberside, both created in the reorganisation of

1974, are to be abolished. It now seems clear that the current local government review will be restricted mainly to undoing the work of 1974.

Last year, Mr Gummer said he wanted the retention of the current system to be the "exception", and expected the commission to recommend unitary councils even if in some cases this involved extra expense. But opposition to the proposals for Somerset and North Yorkshire proved intense.

In Somerset, all the county's Conservative MPs, including the former cabinet minister Mr Tom King, had threatened to vote against the proposals in parliament.

One of them, the paymaster-general Mr David Heathcoat-Amory, had even threatened to resign as a minister over the issue.

The cross-party Association

of District Councils had dubbed the proposal to create a unitary North Riding of Yorkshire "Shambleshire", while Mr Robert Banks, the Conservative MP for Harrogate, described the plans as "a complete load of rubbish".

Sir John Banham, chairman of the government's review commission, said yesterday that views of residents in these two counties "were not clear cut", and that the proposals had been "finely balanced". While there was majority support for unitary councils in both counties, he said, "there was no consensus for any particular solution".

He added: "The commission's pioneering work in measuring public opinion and people's feelings of community has revealed in many other places substantial bodies of opinion wanting local government left as it is."

## Warning on Scottish parliament

A Scottish parliament would take over the present role of the Scottish secretary in the UK government, the Scottish Constitutional Commission said yesterday.

The opposition Labour party has said that it would establish a parliament for Scotland if it forms the next UK government as a forerunner of regional assemblies in Wales and in parts of England. The centrist Liberal Democrats are also in favour. But all parties except the Scottish National party oppose full independence for Scotland.

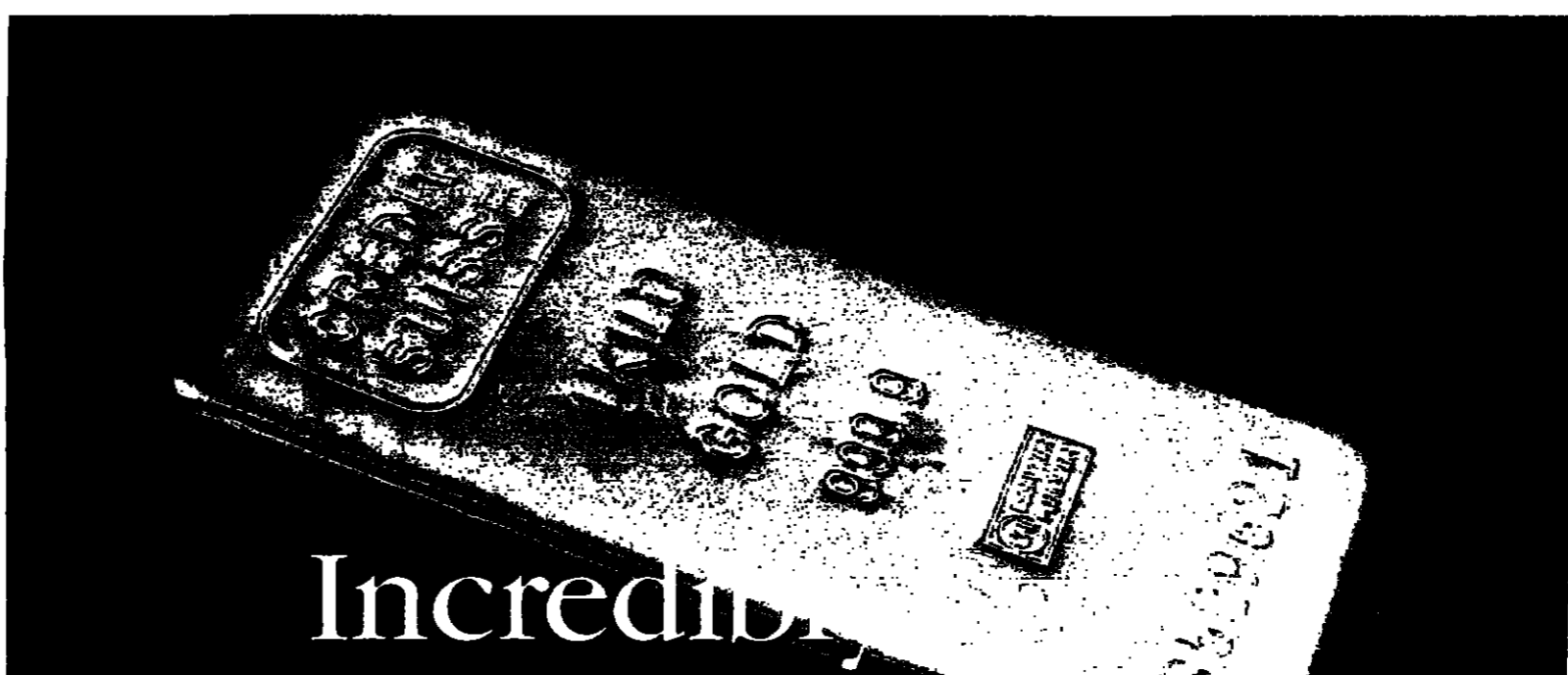
The implication that there would be no role for a Scottish secretary in the UK cabinet is likely to be seized on by Conservative opponents of a Scottish parliament who will argue that Scotland would lose its voice in the UK cabinet.

Yesterday Mr George Robertson, Labour's shadow Scottish secretary, said the commission's proposals were "one more building block in a truly historic construction."

The commission arose out of the Scottish constitutional convention, a body dominated by Labour and the Liberal Democrats which drew up a scheme in 1992. It proposes that Scotland keep its 72 MPs at Westminster after it gains its own parliament.

It suggests that Scottish parliament would have between 100 and 140 members elected by a dual electoral system to ensure that a party which only won about 40 per cent of the vote would not take a majority of the seats.

Mr Robertson said the commission had been right to insist on keeping the current number of Scottish MPs at Westminster. "Since there will be a rolling process of decentralisation throughout Britain there will be no anomaly in retaining Scotland's complement of MPs," he said.



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FT FINANCIAL TIMES Newletters

## NEWS: UK

# Warning on threat to accord in N Ireland

By David Owen, Jimmy Burns and John Murray Brown

Hardline extremists could try to derail the Northern Ireland peace process, Sir Patrick Mayhew, Northern Ireland secretary, said yesterday.

In comments made in Northern Ireland within hours of the reported abduction of the son of an ex-Sinn Féin councillor, Sir Patrick called for "the greatest restraint and self-discipline" from all concerned. Those trying to provoke a return to violence "must not succeed", he said.

Sir Patrick said: "I don't know if it's the case in this instance, but we must expect there will be people who don't wish to see an end to violence and who will be trying to provoke a return to violence."

"Whenever peace comes after a long period of conflict there is a risk hardline extremists will try and provoke a return to violence."

The disappearance of Mr Paul Carroll was the first apparently politically motivated incident in Ulster since the declaration of a loyalist ceasefire two weeks ago.

Last night the mystery surrounding Mr Carroll deepened when his father said that his son was "in safe hands" and was in hiding from the police because he was an informer.

Mr Tommy Carroll contradicted an earlier version put out by members of his family that Mr Carroll had been abducted from his home by masked men.

Police sources in Armagh City said that Mr Carroll had no previous terrorist convictions and was not known to be linked with any terrorist organisation.

However, because of the staunchly republican creden-

tials of members of his family, police were working on the theory that he may have been abducted as part of an internal feud, possibly IRA-related.

Two of Mr Carroll's uncles were shot in separate terrorist-related incidents in the 1980s. Roddy Carroll, a member of the INLA - an extremist break-away group from the IRA - was shot by police allegedly involved in a shoot-to-kill policy. A second uncle, Adrian, was murdered by loyalist paramilitaries.

Loyalist politicians representing protestant paramilitaries were in New York yesterday. They were expected to meet low-ranking administration officials.

The loyalists, led by Mr Gusti Spence a former paramilitary and a convicted murderer and Mr David Ervine, who has also been in prison on bomb-related offences, said they were prepared to meet with Sinn Féin, the IRA's political wing.

The loyalist groups, unlike constitutional unionist parties, have no misgivings about Dublin's proposed cross-border institutions, as long as it is not a "Trojan horse leading to a united Ireland".

Yesterday's events came as Mr Albert Reynolds, the Irish prime minister, told the Dail that the framework document with which the two governments hope to inject momentum into talks involving Ulster's main political parties on the province's future had to strike a "very fine balance".

Meanwhile, Ms Maire Geoghegan-Quinn, Irish justice minister, told the Dail the government would act soon to scrap the Republic's state of emergency, effectively available as an anti-IRA measure for more than half a century.



Deal in his sights: defence secretary Malcolm Rifkind in Kuwait yesterday with a Javelin anti-aircraft missile launcher at a training camp. He was on a two-day visit

## Shorts receives £50m order from Kuwait

Shorts, the Belfast-based aerospace company, has received a £50m order for air defence missiles from Kuwait.

The announcement of the order came at the end of a visit to the emirate by Mr Malcolm Rifkind, defence secretary. The order was said to be a surprise to the Ministry of Defence, the Defence Export Services Organisation and Shorts.

The company will supply Kuwait with the Starburst shoulder-launched anti-aircraft missile.

Starburst - the immediate successor to the Javelin system, which Shorts has sold to more than 10 countries - has been developed to destroy high-performance low-flying aircraft as well as attack helicopters.

The Starburst is a competitor to the

US-made Stinger missile, which was used by rebels in Afghanistan against Soviet aircraft.

Mr Terry Stone, Shorts Missile Systems chief executive, said: "We are delighted that Starburst was selected over its rivals to win this prestigious multi-million pound contract."

"Its forward hit capability and

unjamable laser guidance clearly proved it is in a class of its own and we value highly the Kuwait government's endorsement of Starburst's effectiveness."

Shorts, which has been promoting Starburst in the Middle East, particularly Kuwait, since 1991, said the contract would not affect plans to cut 240 jobs at its plant in Belfast.

## Heathrow tunnel collapse delays work a month

By Charles Batchelor, Transport Correspondent

Work on the collapsed section of tunnel under terminal three at Heathrow airport, London, is unlikely to resume for at least a month, BAA, the airport operator said yesterday.

A preliminary investigation into the causes of the collapse, which has caused traffic chaos around the airport, is expected

to take 10 days.

Up to a further three weeks will elapse while the contractors, Balfour Beatty, and BAA decide what action can be taken.

BAA said that although travellers might have difficulties getting to Heathrow, the tunnel workings posed no threat to the operations of the airport or the airlines using it.

The controversial "new Aus-

trian tunnelling method" is being used on only two short sections, where stations are being built at the two terminal complexes. Conventional boring methods are being used under runways and for the rest of the 4½-mile tunnel.

The problems at Heathrow started on Friday when earth began slipping into the tunnel near the terminal three car park during construction of the

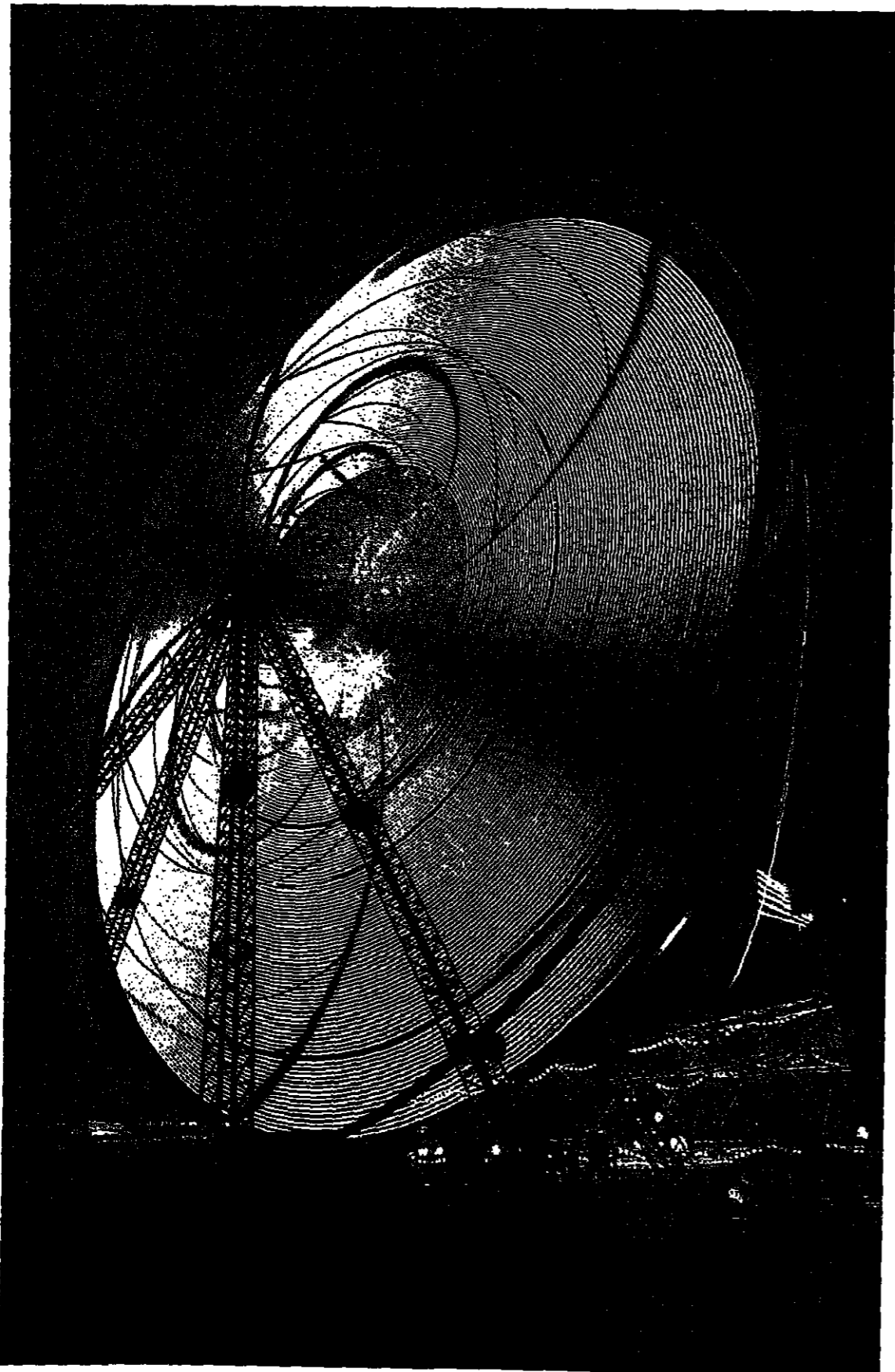
£300m Heathrow express rail link to Paddington station.

Work has also been suspended on parts of the Jubilee Line extension to London Underground where the Austrian method was being used. The suspensions, at London Bridge and Waterloo, are likely to continue at least until the findings are known of the preliminary investigation at Heathrow.

Concrete has been pumped into the collapsed section of the tunnel to stabilise the ground and the office building above it which was being used as project headquarters for the tunnelling. BAA said the area was "95 per cent stable". Most of the multi-storey car park at terminal three, closed on Friday, reopened yesterday.

The investigation team will be led by Mr David Williams,

technical director of BAA, and will involve three groups of consultants, Mott MacDonald, Geoconsult and Ove Arup. "We won't be starting work for another month on the site but work is continuing elsewhere," BAA said. Work at Heathrow started in April. Tunnelling is still in its early stages with 180 metres dug in the central area and work just beginning north of the airport.



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## BUSINESS AND THE ENVIRONMENT

Producers are hoping to tap a growing market for natural fibres, writes **Alison Maitland**

# High hopes for hemp

To the untrained eye they look like bales of straw. But the bundles of long, greyish fibre drying in the late autumn sunshine on 40 farms across south-east England are attracting an unusually high degree of excitement.

The fibre is hemp, part of the cannabis family, a centuries-old crop which is making a comeback in Europe and the US as an ecologically friendly raw material for clothing and paper.

The association with the dope-smoking 1970s meant that not only farmers' hopes for the crop were riding high when the first commercial plants appeared in the UK last year. But the youngsters who raided a field and filled dustbin bags with plant tops were disappointed. "This is a low narcotic variety," explains Ian Low, a director of Hemcore, the UK's only hemp merchant. "You'd have to smoke 50 acres to get high."

Hemcore, set up 18 months ago by an Essex farmer and a group of agricultural merchants, persuaded the Home Office to license its first 1,500 acres of hemp last year. It hopes this will give it a lead in the growing market for natural fibres - particularly in the US and Germany. Neither country permits domestic production because of the association with drugs.

Yet hemp's roots go back to

the Middle Ages, when it was grown widely in East Anglia. It was used in Europe for ropes, sails and sackcloth until early this century, when it was ousted by imported cotton and jute.

Hemcore is hoping to turn the wheel full circle, reaping capital from the fact that the first jeans were made of hemp in early 18th-century America. It has contacted Levi Strauss, the leading US jeans manufacturer, which is "very interested" in the fibre, says Low.

He admits Hemcore has some way to go in developing the technology to make hemp soft and stretchy. It is collaborating with flax processors in Northern Ireland on refining the coarse fibres.

Some textile agreements are already under way, however. Esprit, an international fashion business based in San Francisco, plans to launch bags, jackets, shirts and skirts made of hemp and hemp-and-wool mixtures next year as part of its "Ecolle" collection. One of its suppliers is Evergreen, a Yorkshire textile company which buys its hemp from Hemcore.

"Hemp fits in with our environmental objectives," says Lynda Grose, research director for the Ecolle collection. "It is grown with minimal watering and no pesticides and herbicides. It is also very durable." The crop, planted in late

spring, surges to about 10ft in three months. Before planting, the soil has to be prepared with fertiliser because hemp takes up a lot of nutrients. But no chemical sprays are needed as the plants are hardy and grow quickly enough to out-smart weeds.

The powerful roots break up the soil, leaving it fertile for the next crop. Experience in east Europe, where hemp was an important industrial crop before the break-up of the Soviet Union, suggests that yields of wheat grown in fields where hemp has previously been cultivated are 0.7 tonnes a hectare higher than those achieved following any other rotational crop. Hemp roots are also rapidly biodegradable, making ploughing easy.

The revival of interest in fibre crops in the European Union springs both from growing consumer demand for "natural" clothes and from farm policy reforms. In France, Italy and Spain, hemp survived the onslaught of imported fibres earlier this century and continued to be grown for paper pulp production.

But the introduction two years ago of set-aside, the policy which obliges EU farmers to take land out of food production, has boosted the search for new markets for industrial crops such as hemp. The European Commission provides generous subsidies of £245 an acre for fibre crops and



Stable future: fast growth and durability make hemp viable for use in products from horse bedding to textiles

exempts such crops from set-aside rules. Cereal farmers who grow flax or hemp can thus reduce the overall amount of land they have to leave idle.

If "green" textiles look like being the most immediately lucrative market for hemp, paper-making is likely to absorb the biggest volumes. The long fibres are particularly suited to thin or open-textured paper, such as cigarette paper, tea-bags or coffee filters. They can also be used to strengthen recycled paper.

A £10m (£3.7m) four-year project funded by the Dutch government recently concluded that hemp was an economically viable crop for making anything from bank notes to newspaper.

A novel mechanical processing technique developed by the Dutch Land Organisation, which carried out the research, is attracting interest from paper producers in Australia, New Zealand, Canada, Sweden and the UK.

Thea van Kamenade, project co-ordinator, said hemp could also be used for building materials and as a reinforcing agent in plastic car components. "I would expect hemp to make a big comeback," she said.

Earlier this month, the UK government announced a £100,000 three-year grant to develop new markets for natural fibres such as hemp and flax.

Silsoe, the government-funded agricultural research

station, has developed a machine to strip the bark off the stem and extract the fibre from these crops. Its aim is to enable individual farmers to process their own hemp into crude fibre, which could then be turned into padding and stuffing for the furniture industry.

"If we can make full use of all the material from the plant, it will be in the top league," said Harry Gilbertson, natural-fibres expert at Silsoe. Hemcore itself is investigating uses for other parts of the plant such as the seeds, whose oil is suitable for cosmetics.

"If we look into the next century, I think it will be very big," says Low. "There could be tens or hundreds of thousands of hectares of hemp."

But when vision threatens to overcome reality, Low points out that one of the company's best markets today is decidedly down-to-earth. Hemp, being highly absorbent, is increasingly popular in Germany and Britain as bedding for horses.

## A rumbling in the waterworks

Jane Martinson on attracting tourists to a sewage plant

Managers of a sewage treatment plant in south-east Australia are considering plans to turn it into a tourist attraction.

The 10,851 ha plant - which produces more beef than any farm in the region - treats 55 per cent of the wastewater generated by the city of Melbourne. Natural purification methods rather than chemical treatment are used to produce effluent, which is deposited in Port Phillip Bay. Some 18,000 cattle graze the grass fertilised by raw sewage; livestock generated just over A\$3m (£1.4m) in income last year.

Much of the sewage is treated in lagoons, which cover 1,667 ha at the Werribee site, 35 km south-west of Melbourne. Three large lagoons built in the past six years have been designed to control odour and produce biogas. Mechanical aerators speed up the process of digestion and reduce odour, while covers are being installed to capture methane and other odorous gases. The methane will eventually be burnt off to generate power.

The plan to create an "eco-tourist park" focuses on 600 ha of older lagoons. Over 250 species of birds are found around them. Many rare species have been recorded, including up to 50 per cent of the world's total of the orange-bellied parrot. The area is listed by the International Union for the Conservation of Nature as a wetland of international importance.

A study conducted this summer by Melbourne Parks and Waterways claimed the sewage plant could attract up to 160,000 tourists a year if developed as an eco-tourist park. The organisation manages a funding programme which aims to encourage community use of open spaces and the preservation of wildlife. Last year it allocated A\$6.2m to such schemes.

Melbourne Water, the state-owned authority which manages Werribee, says there is "definite commercial potential there" and has commissioned a full economic analysis of the project.

There are a number of advantages to the plan, not least enhanced public relations. Melbourne's sewers, with their network of old brick tunnels, suffered three serious collapses two years ago. Sewage spilled into a local river and it took more than three months to stem the flow.

More recently the Environmental Protection Agency, the government watchdog, has decreed that checks on effluent discharges into Port Phillip Bay are to be made much more stringent by 2004. Melbourne Water has committed itself to complying with the regulations by 1997. It has also earmarked A\$33m for upgrading its two major treatment plants.

The impact on wildlife of a significant increase in visitor numbers is causing some concern, however. Alex Sandles, the wastewater treatment manager at Werribee, says birds are attracted by the food, security and calm of the plant. "The lakes near here tend to be full of waterbirds and other noise."

The plan has some support among environment groups. Karri Giles, water catchment manager for Friends of the Earth in Australia, says: "We are positive as long as it is done sensitively."

However, the proposal may be delayed by the shake-up planned for Melbourne Water by a state government keen on privatisation. It was to appear before the authority's board in November.

Nonetheless, Sandles feels the plan will be implemented. Werribee treatment plant could become part of a "complete weekend package" for Melbourne's tourists, he says.

## Mahogany controls loom

One of Europe's biggest importers of hardwoods is backing a Dutch government initiative to control the trade in Brazilian mahogany under a United Nations convention.

Timmet, of Oxford, has surprised environmentalists by going against its trade association and supporting a proposal to declare officially that Brazilian mahogany is an endangered species.

The UK is the second biggest consumer of the wood, importing about 35 per cent of Brazil's production. Forty per cent goes to the US. The World Wildlife Fund for Nature (WWF) says the trees, which grow slowly, are on the verge of extinction.

"Brazilian mahogany will become a thing of the past if the trade continues extracting logs at present volumes in the way that it does," says Francis Sullivan, forestry conservation officer at WWF UK.

Daniel Kemp, chairman of Timmet, says the proposed listing will not hamper trade. "But we feel there will be more control and in the long term that will be good for business."

The Dutch government will propose the listing at next month's meeting of the Convention on the International Trade in Endangered Species (Cites) in Florida.

Cites has a two-tier list of endangered species. Appendix I includes those which are virtu-

ally extinct and in which all trade is banned, such as ivory, some rare birds and Brazilian rosewood. Species listed on Appendix II can be traded but under restrictions. If the Dutch succeed and Brazilian mahogany joins this list, it would compel the Brazilian government to ensure that the trade does not harm the species. Importers would have to obtain export permits from Brazil. The UK Timber Trade Federation is against a listing. It says there is not enough scientific evidence to justify it and Brazil does not support the initiative. Timmet remains a member of the federation.

Peter Knight

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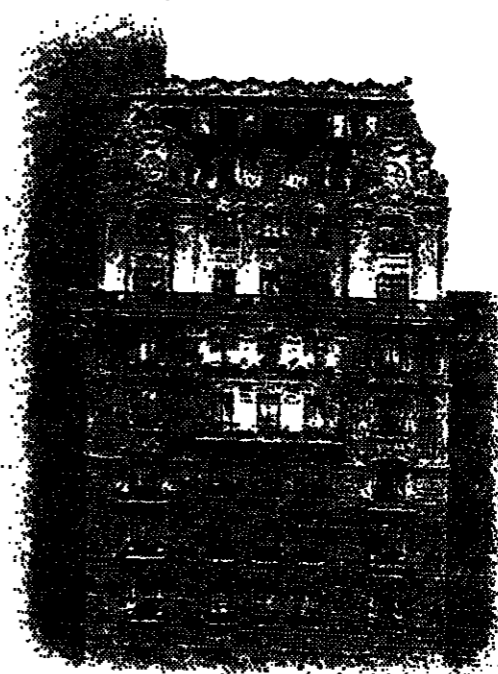
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Burning slick pours into two rivers in Komi province

## Arctic threatened by oil spillage in north Russia

By George Graham  
in Washington, John Thornhill  
in Moscow and Anthony  
Robinson in London

A burning oil slick spilling out from a pipeline in the northern Russian province of Komi is threatening to create an environmental disaster in the fragile Arctic.

Komi officials asked Moscow for help in dealing with the spill yesterday, after the New York Times had already reported the leakage and said that it amounted to only 100,000 barrels. But Mr Bill White, the US deputy energy secretary, said a US company at the site had estimated the spill at 2m barrels, nearly eight times the size of the Exxon Valdez disaster in Alaska.

Another western company had measured the slick at 1 metre deep and 12 metres wide, stretching for 6-7 miles. "It is a significant spill, whether it be 100,000 barrels or 2m or somewhere in between. The fact is the Arctic environment heals a lot more slowly

than other environments," Mr White said.

The oil slick is reported to have built up from leaks in a 47km pipeline run by Komeft, a Russian oil production association. The leak is believed to have begun in February, but had been retained by an earth dam.

Following heavy rains this month, the dam burst, spilling oil into the Kova River, which runs into the Pechora River and the Barents Sea. US officials say the slick was probably set on fire in an attempt to contain it.

The US Department of Energy yesterday released a video of the leak showing flaming oil flowing down a river.

The river, which is expected to freeze over in the next two weeks, would extinguish a thin slick.

The Komi Republic is one of the richest of Russia's oil provinces, but the government only advised the Moscow disaster centre yesterday, after news of the spill had been published in the US.

Russian government officials

said last night the spill was under control and that environmentalists' claims were alarmist.

The region is of great interest to western oil companies seeking to exploit the nearby Timan-Pechora basin. A consortium of companies, including Conoco of the US and Norsk-Hydro of Norway, is studying the feasibility of building an offshore terminal to ship oil to western markets.

Vast areas of ecologically fragile Russian tundra have been churned up over decades by exploration vehicles or turned into polluted bogs by oil from leaking pipes and production platforms.

The latest accident is not an isolated incident in a country where production at all costs has been the rule for decades. The pipeline had been leaking since 1988 and had been repeatedly patched until nearly 9m gallons of oil and oil products poured out in a second spillage three months ago.

Much of the oil will probably spread into the surrounding marshlands.

## UK advance promises quicker computers

By Clive Cookson,  
Science Editor

British researchers, funded by a Japanese company, announced a breakthrough yesterday in electronic miniaturisation. They said it could lead to computer memories and microprocessors one five-hundredth the size and 500 times faster than today's silicon chips.

Scientists at the Toshiba Cambridge Research Centre and Cambridge University have jointly developed the world's first process for making "quantum effect integrated circuits". These futuristic devices consist of millions of microscopically small components on a fingernail-sized chip.

Professor Michael Pepper, managing director of the research centre, said the achievement was comparable to the original discovery in 1958 of the technology for making the silicon chip.

That breakthrough led to the "information technology revolution" which started in the early 1970s and is still gathering pace. Many electronics laboratories have made such microscopic components, including "quantum wires" 100,000 times thinner than a human hair. But their individual production is painstakingly slow and expensive.

The Toshiba process makes it possible to mass-produce them on integrated circuits like orthodox chips. The process has several stages and is technically complex, but Prof Pepper said it was "highly manufacturable" and could readily be transferred to a production environment at reasonable cost.

The microscopic components - no more than 10 atoms across - are so small that the electrons in them behave both as particles and waves, in accordance with the somewhat bizarre predictions of quantum theory. This allows the circuits to switch far faster than those in conventional chips.

The main technical barrier still to overcome is that today's quantum devices can only operate when cooled in liquid helium to temperatures close to absolute zero. Scientists can, however, foresee them being developed to work at room temperature.

Chips based on the technology could reach the market in about 10 years. There are many possibilities, including super-fast memory and logic circuits for computers, as well as more precisely controllable lasers.

Mr Sei-ichi Takayanagi, Toshiba's senior adviser on research, said the technology was still too far from the market to transfer to the company's Japanese R&D laboratories. It would be developed further in Cambridge for five years or so and licensed to other companies that want it. Prof Pepper predicted that many new applications would emerge, which no one had yet thought of. "Think of all the changes in computing and communications over the last 25 years, and try to extrapolate those 25 years ahead," he said.

## THE LEX COLUMN

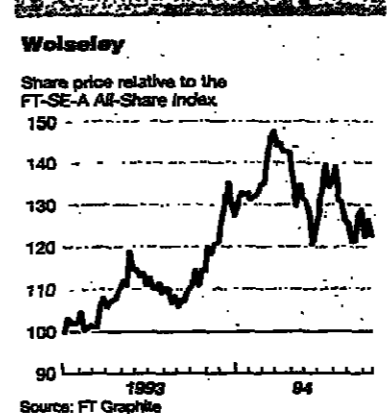
### Sprint's triple jump

For the first time since the break-up of AT&T, US consumers will be able to choose the same brand for local, long-distance and mobile phone calls. That, at any rate, is the objective of Sprint's alliance with three of the largest US cable television groups. Actually achieving this aspiration will not be easy. Massive investment and regulatory changes will be needed before the cable tv companies' networks can provide local phone services. Similarly, the partners have only a small role in mobile communications, though this could change if they are successful in winning licences in the US government's forthcoming auction.

Sprint's alliance is a ground-breaking event in the fast-changing US communications landscape. The Baby Bells, the dominant forces in the local telephone market, are the most vulnerable. Not only could they lose local customers to Sprint's venture, their high margins for providing local access to long-distance operators will be under threat. The Bells are likely to respond by redoubling their efforts to be allowed to enter the television and long-distance markets, while building their own alliances in mobile communications.

Sprint's long-distance rivals may be under pressure to respond too. Much depends on whether consumers would really prefer to buy packages of local, long-distance and mobile services from a single source. If Sprint is right, AT&T will need to add a local offering to its existing long-distance and mobile services. MCI, whose attempts to knit together mobile alliances have so far floundered, will have even further to go.

Share price relative to the FT-SE-A All-Share Index



Source: FT Graphite

where manufacturers appear increasingly competitive. It will also need to cope with additional imports from East European suppliers which should have sorted out their difficulties by then.

If Europe's industry is ever to become self-supporting and provide a decent return on capital, the Commission will have to reject demands for state subsidies next time round. Aid may preserve politically sensitive jobs, but it perpetuates inefficient production and costs huge sums to the taxpayers. Most importantly, subsidies threaten free trade. If Europe's steel industry is to prosper it must export, especially to Asia where growth is strong and capacity shortages exist. Asian doors will be justifiably barred to a subsidised European steel sector.

### Wolsley

Wolsley's profits weathered the recession much better than the rest of the building materials sector so it was only to be expected that its recovery would be less dramatic. Only to be expected, but wrong. While few other companies are anywhere near matching their previous peak profits Wolsley's earnings per share have now topped the 1990 record by more than a third.

The achievement is all the more impressive given that two-thirds of Wolsley's UK distribution sales go into the still depressed repair and maintenance market. In the US it has been boosted by a building boom in the Carolinas. But the success of Brossette in the difficult French market proves once again what a successful and highly exportable formula Wolsley has developed.

Foiled too often by the management's cautious statements, the City is looking for healthy growth for the next couple of years. Apart from France, it would be optimistic to look for significant further improvements in its main markets. The US may have a little way to go and Wolsley could hope for some return in the UK, but margins are already near the peak achieved in earlier inflationary times.

However, Wolsley has shown it can thrive in low growth conditions and there is no reason to suppose the flow of acquisitions will dry up. Given its muscular balance sheet and buoyant cash flow, the group may step up the pace and scale of its deals. But it would be wrong to expect anything spectacular. That would not be Wolsley's style.

### Pensions

The scale of the UK's personal pensions scandal continues to shock. It now looks as though about 650,000 people were persuaded to take out personal pensions instead of staying with or joining company pension schemes. Compensation for such "opt-outs" could exceed that for those who stopped working for a company and then transferred a lump sum out of its scheme. Nobody knows how big the total compensation bill will be. But the figures of £1bn-£2bn being bandied around do not look ridiculous.

Many life companies will be able to shield their shareholders from the worst of the damage. The bulk of the compensation may be paid from "with-profit" funds, meaning policy-holders will bear the pain. Unit-linked groups

### European steel

The main problem with the European Commission's rationalisation plans for the steel industry was timing. The moment to cut capacity is when an industry heads into recession, not when it is clambering back to profitability. No management will cut capacity when its plants, however inefficient, are set to generate cash.

Even so, the Commission's failure to tackle the industry's structural overcapacity will have a long-term cost. The pain during the next trough is likely to be that much worse. Continuing excess capacity will once again drive prices so low that steel makers will be unable to cover their fixed costs. But next time the sector will find it more difficult to export its way out of trouble, particularly to the US.

## UK life insurers face \$3.2bn bill for wrong pension advice

By Alison Smith and Jim Kelly

UK life insurers must review hundreds of thousands of personal pensions sold since 1988 and compensate those investors who were wrongly advised to buy them, the Securities and Investments Board said yesterday.

Estimates of the potential bill for compensation are now put at up to \$2bn (\$3.2bn) by Coopers & Lybrand, the accountants.

The SIB announcement came after a detailed study of the scale of poor advice in selling personal pensions. It concluded that this was far greater than had been thought.

"It is now clear that too many personal pensions were improperly sold in the past," said Mr Andrew Large, SIB chairman.

The SIB, the chief London financial regulator, has told life companies and independent advisers to review the cases of at least 350,000 customers before the end of 1996.

Most UK life companies - including Prudential, the largest - reserved judgment on the report. Some welcomed it, including Pearl Assurance and Bradford and Bingley Building Society, the largest organisation to offer independent advice.

Legal & General, one of the UK's largest life insurers, voiced dissent. Mr David Prosser, chief executive, said the SIB had put too great a burden on the life industry, and L&G would have to make additional provisions.

Since 1988, some 600,000 personal pensions have been sold to people transferring lump sums from UK occupational schemes. Separately, a survey for the SIB by actuaries Bacon & Woodrow has also estimated that in more than 850,000 cases, people were advised to opt out of their employers' schemes or not to join in the first place.

In March this year the SIB said that advice to take a personal pension by opting out of or not

joining an occupational scheme nearly always meant lower retirement benefits, and should be generally presumed to be wrong.

Mr Large said yesterday that the SIB's programme was intended to minimise the need for investors to go to court to get compensation.

The apparent extent of poor advice has renewed public concern about standards of selling and of regulation in the life industry.

Compensation to investors who have suffered from bad pensions advice will have to be paid in the first instance by the life company or independent adviser that sold the pension.

Where an adviser has gone out of business, investors will be eligible for compensation from the Investors Compensation Scheme.

Most life houses welcome SIB plan, Page 8

Editorial Comment, Page 15

See Lex

## Saudi Arabia Major probes sleaze

Continued from page 1

position has steadily deteriorated and the impact on the market has become ever more apparent." It added: "Repeated promises of payment from senior Saudi officials, including promises made directly to UK trade ministers, have not been fulfilled and there is no suggestion of an early improvement in the situation."

Continued from Page 1

report says that other ministers had been questioned as a result of the allegations first passed to Mr Major three weeks ago. Sir Robin concludes that the allegations were "demonstrably false". The director of public prosecutions has been asked by Mr John Major to examine notes of a meeting between the prime minister and an intermediary, who

was allegedly acting on behalf of Mr Mohamed Fayed and made allegations about pay to MPs.

Mr Major disclosed the involvement of the DPP in response to suggestions from a Conservative backbencher, Sir Peter Tapsell, that Mr Fayed should be prosecuted for blackmail.

The allegations were dismissed by Mr Fayed who said he would sue Sir Peter if he made his suggestions outside the House.

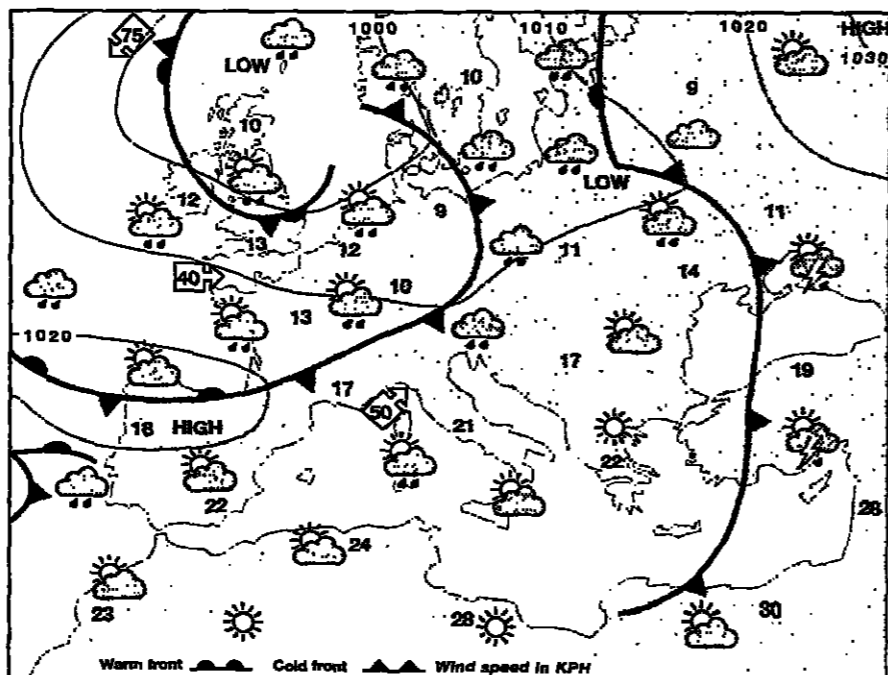
### FT WEATHER GUIDE

#### Europe today

A series of fronts will dominate Europe. One front, associated with low pressure north of the UK, will cause rain in northern parts of the British Isles. Showers will occur elsewhere in the UK and in the Benelux and north-west France. A second frontal zone will produce rain in southern Scandinavia, western Poland, the north-west Balkans and over the Alps. This front will produce cloud but not rain in southern France and northern Spain. Cloud and sunny periods will occur elsewhere in Spain and France as well as in Italy and the north-east Balkans. A third frontal zone will bring rain to the Baltic states and western Russia. Western Turkey will have thunder showers.

#### Five-day forecast

Low pressure will approach western Spain, creating a frontal zone which will bring rain to south-west Europe. Rain is also expected in south-east Europe during the weekend. North-west Europe will continue to be unsettled. Scattered cloud will be interspersed with showers and temperatures are expected to fall. The southern Balkans will be sunny but thunder showers will recur during the weekend.

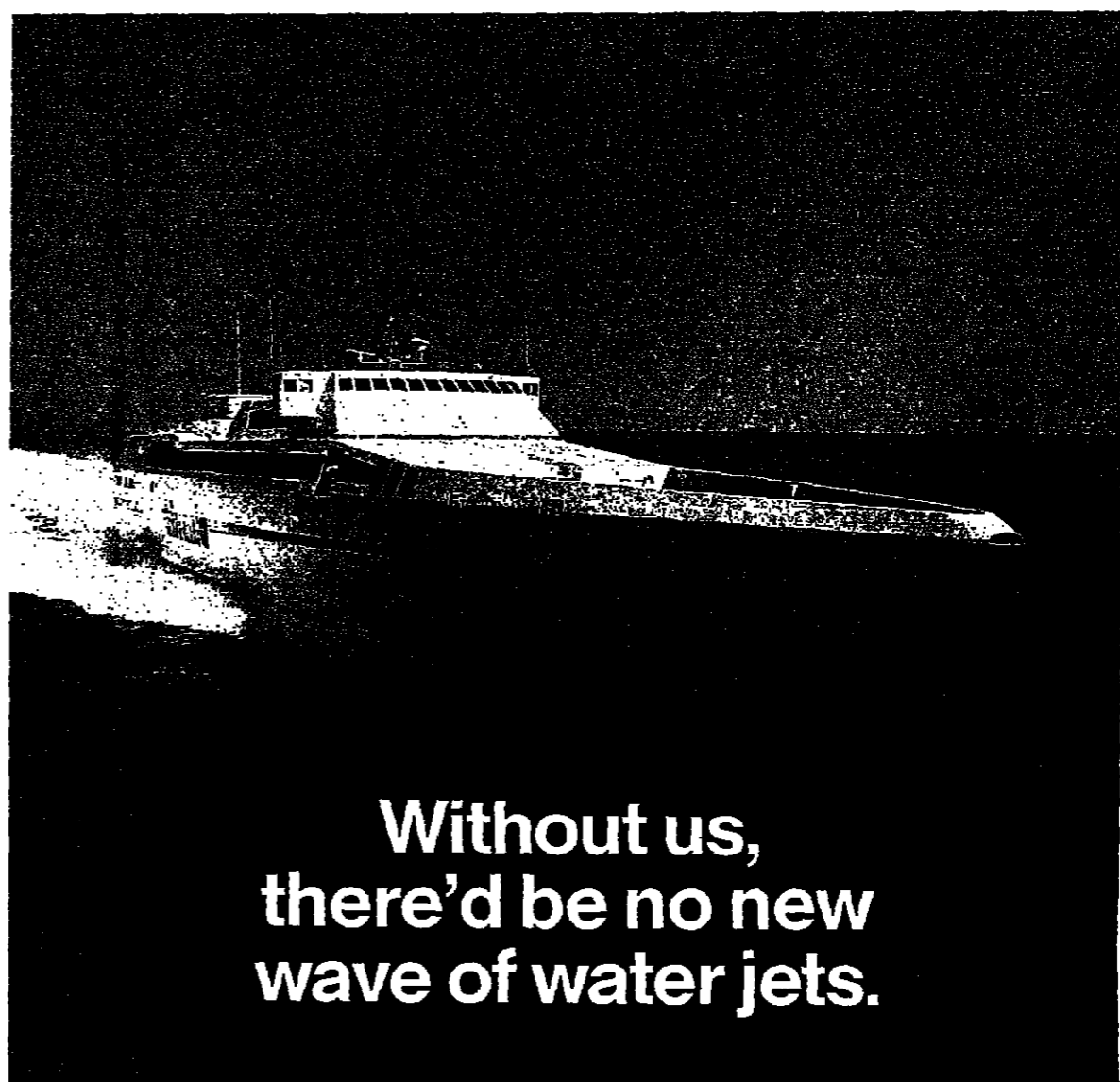


#### TODAY'S TEMPERATURES

Abu Dhabi	33	Beijing	17	Caracas	31	Faro	21	Madrid	17	Rangoon	33
Algiers	21	Belfast	11	Cardiff	11	Frankfurt	10	Malaga	22	Reykjavik	3
Amsterdam	13	Berlin	11	Chicago	18	Geneva	10	Manila	25	Rio	25
Athens	23	Bombay	27	Cologne	12	Glasgow	11	Medan	31	Rome	21
Bahia	23	Buenos Aires	21	Dakar	21	Hamburg	11	Mexico City	20	Seoul	18
Bangkok	28	Calcutta	24	Delhi	32	Hong Kong	26	Montreal	11	Singapore	28
Bombay	28	Chengdu	13	Dubai	31	Istanbul	11	Moscow	8	Sydney	26
Buenos Aires	18	Chongqing	10	Dublin	10	Jakarta	26	Mumbai	29	Taipei	22
Burkina Faso	28	Cairo	20	Edinburgh	11	Kuala Lumpur	26	Nairobi	24	Tokyo	21
Barcelona	19	Cape Town	19			Kuwait	35	Naples	21	Toronto	13
						Las Palmas	25	New York	14	Vancouver	18
						Lima	21	Nice	18	Vienna	11
						Lisbon	19	Nicosia	25	Warsaw	12
						London	13	Oslo	7	Washington	15
						Luxembourg	8	Paris	13	Wellington	15
						Lyon	14	Perth	22	Whitby	15
						Madrid	24	Prague	10	Zurich	9

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## INTERNATIONAL COMPANIES AND FINANCE

## Ras to raise L2,300bn to finance Elvia acquisition

By Andrew Hill in Milan

Riunione Adriatica Sicurtà, the Italian insurer controlled by Allianz of Germany, is to raise at least L2,300bn (\$1.5bn) with an issue of shares and bonds at a deep discount to the market price.

The capital increase will pay for its acquisition of Elvia, Switzerland's fifth-largest insurance company, which should be completed next year.

Allianz, which controls just over 50 per cent of Ras, announced at the end of last month that the Italian insurer would buy a 60 per cent stake in Elvia from Swiss Reinsurance, the world's second largest reinsurer. Swiss Re is selling its non-core businesses. Under its operating accord with Allianz, Ras is responsible for the insurance activities in

Switzerland, Austria, Portugal and Spain.

Although the capital increase was expected, the timing, with Italian and world markets depressed, hit the Ras share price. Ordinary shares in the company fell 3.6 per cent to L17.882, compared with an opening price of L18.949 and an offer price of L22.000 a share. Allianz has indicated it will underwrite its share of the capital increase.

Mr Attilio Lentati, managing director of Ras, said if the group had waited for more positive markets, it might have lost the opportunity to expand its Swiss operations. "The operation in Switzerland presented itself as an investment opportunity, and we were the logical partner," he said.

In the first stage of the Elvia acquisition, Ras will acquire

Swiss Re's 60 per cent stake, and then launch a full bid for the outstanding shares. The group yesterday estimated the overall investment at SF2,220bn (\$1.72bn).

Ras will raise L1,150bn with an issue of 77m ordinary shares and up to 42.3m savings shares priced at L12,000 and L7,000 respectively, on the basis of two new shares for every five held. A further L1,150bn will be raised for Ras with the issue of three-year bonds by Mediobanca, the Milan bank which specialises in medium- and long-term corporate lending, offered to Ras shareholders on the same basis and at the same price as the shares.

Warrants attached to both the shares and bond issues could raise L570bn when converted into Ras shares in 1997.

## EBRD in moves to alter bank strategy

By Anthony Robinson, east Europe editor

The European Bank for Reconstruction and Development (EBRD) is shifting away from loan finance to a greater use of equity products, wholesale banking and trade finance, Mr Jacques de Larosiere, the bank president said yesterday.

The restructured bank was becoming more of a wholesale banker by lending and investing large sums of capital in local banks and training staff, he added at a meeting organised by the Royal Institute for International Affairs but hosted by the Bank of England.

Since 1991 the bank has approved lending and investments of more than Ecu750m (\$922.5m) to 40 banks in 14 countries and approved an additional Ecu225m of equity to 31 investment funds. These two activities accounted for more than 20 per cent of the bank's committed portfolio of 221 board-approved projects in 21 countries at end-September, Mr de Larosiere added.

The EBRD began by taking a 28.5 per cent equity stake in Poland's Wiekopolski Bank Kredytowy for \$12.7m in April last year. Its most recent banking foray was last month's \$35m investment for 14 per cent of Russia's Tokobank.

Since the resignation of Mr Jacques Attali last year the new president has pushed through cost-cutting and organisational changes which created a banking group organised into specific country teams. Over 40 bankers have been relocated from the London head office to 14 resident offices.

The EBRD annual meeting in St Petersburg in April committed it to projects in all 25 of the states emerging from the collapse of the Soviet empire. "This means smaller loans, more risk and a greater use of credit lines, bank-to-bank loans, equity funds and direct equity investment in financial intermediaries," Mr de Larosiere said.

## Stonecipher plays a difficult hand

The McDonnell Douglas chief knows how to gamble, says Bernard Gray

Harry Stonecipher likes to play cards. "Poker and gin rummy - gin rummy is a good game," he smiles. Unfortunately, poker sessions these days are a little limited.

"It's difficult to get five or six people together for a game, but a group of us do tend to play poker in hotel rooms after aerospace association meetings and conferences."

Mr Harry Stonecipher, the new chief executive of McDonnell Douglas, will have less time for cards in smoke-filled convention rooms, but he may still play several difficult business hands there.

The US defence industry has been consolidating rapidly as military spending has plummeted. The challenge is to rationalise in the face of far lower production runs.

Even big companies such as IBM and Ford have sold their defence arms. General Dynamics has dismembered itself at auction and Lockheed and Martin Marietta have merged.

McDonnell Douglas had to stand apart from such deals. Its finances were too weak for the company to become a buyer, while pride prevented sales.

The result is that the once-unrivalled group is steadily being caught. Its policy of splendid isolation may not be an option for much longer.

McDonnell is constrained by its mix of products. New aircraft are the lifeblood of the aerospace business, yet McDonnell has no part in the \$71bn F-22 next generation fighter for the US air force.

Some of its aircraft are getting long in the tooth: the F-15 is the company's top fighter, but it first flew in the early 1970s. The only new military aircraft McDonnell has is the C-17 transporter, which is late and heavily over-budget.

McDonnell has already written off about \$1bn in cost overruns on the C-17. Production may be stopped at 40 aircraft next year unless deliveries speed up and the price tag drops from the current \$280m each.

Mr Stonecipher is the first person in the history of the St Louis-based aerospace company to be chief executive without the benefit of his name



Harry Stonecipher: 'getting the C-17 right is my top priority'

over the door. He is neither a McDonnell nor a Douglas - he is an outsider. He will have to win the backing of the board and the workforce for changes, without the benefit of a lifetime of McDonnell Douglas company politics.

However, he is cheerfully upbeat about prospects. "This

**'We are financially stronger and looking for partners in Europe and the Pacific rim who can give us access to markets'**

company has a great portfolio of products, the Apache [attack helicopter], the F-15 and F-16 [fighters] and the Delta [rocket], they stand us in good stead. I would rather have existing products which we can develop and make more affordable, than very expensive future programmes which stand a good chance of being cancelled outright."

The objective is to persuade

the US government and potential overseas buyers that McDonnell's current technology is a better bet. To do that the company is evolving its designs and introducing small-batch manufacturing techniques to cut the cost of each aircraft.

An F-16 costs about \$45m. If

than 40 aircraft for the USAF and if we can get its cost below \$200m each, then I think there are substantial export opportunities."

For the C-17, the crunch comes next July when a month-long trial, partly in simulated war conditions, will determine whether the programme lives or dies.

The other short-term priority is the civil division, Douglas Aircraft. It is limping behind Boeing and Airbus, and Mr Stonecipher is looking for strategic alliances - "but not for financial reasons like the deal with Taiwan", a proposed joint venture which eventually fell apart. "We are financially stronger now and are looking for partners in Europe and the Pacific rim who can give us access to markets," he says.

That increased financial strength may also increase the potential for acquisitions. But have all of the best opportunities already gone?

Buying Boeing's defence business would make sense. It would give McDonnell a stake in the F-22 and consolidate two of the players in the splintered helicopter industry. But Boeing has little reason to sell. Northrop Grumman may be too large to swallow and faces a similar shortage of new products. Lockheed has married another.

If McDonnell's board has any worries that it has missed out, Mr Stonecipher betrays no sign of them. He is a cheerful and engaging character, a trait which plays well to the workforce. The habit of wandering in to talk to the 5,300 staff also encourages the image of a man of the people.

Mr Stonecipher has the great advantage that much of the worst bloodletting has already been done at McDonnell.

With the workforce down to 65,000 from 135,000 in three years, and the C-17 and commercial aircraft operations back on an even keel, the new chief executive can afford to talk of motivation and building the business.

However, the challenge for his tenure, is to bluff his way out of a strategic problem with a hand which has weakened, against other companies which have drawn some good cards. It will not be an easy task.

## BCP earnings drop 9.7% at nine months

By Peter Wise in Lisbon

Banco Comercial Portugues, Portugal's fifth-largest bank, yesterday reported a 9.7 per cent drop in nine-month net income to Es13.5bn (\$86.3m) from Es14.8bn in the same period last year.

The bank attributed the slide to a sharp decrease in profits from trading activities as a result of lower interest rates on bond and money markets.

In spite of a slowdown in credit and deposit growth in Portugal due to recession, BCP's net assets grew 17.9 per cent to Es2,052bn compared with the first nine months of 1993.

Total deposits rose 17.5 per cent to Es1,635bn but credit to customers grew only 2.6 per cent to Es517bn.

Cash flow increased 3.9 per cent to Es45.9bn.

BCP's hostile bid for a controlling stake of 40 per cent of Banco Portugues do Atlantico, Portugal's second-largest bank, was vetoed by the government in September.

## Wolseley rises 67% as divisions flourish

By David Blackwell in London

Wolseley, the world's biggest supplier of heating and plumbing equipment, lifted annual profits 67 per cent after a strong performance from all its divisions, coupled with good contributions from acquisitions.

Pre-tax profits for the year to the end of July were at the top end of analysts' expectations at £202.3m (\$319.63m), up from £121.1m. Turnover rose 31 per cent from £2,490m to £3,250m.

Mr Jeremy Lancaster, chairman and managing director, said the results from the divisions across Europe and the US had an element of Alice in Wonderland - "everyone has won and everyone deserves prizes".

The biggest gain came from the US, where profits from building distribution leapt to \$56.8m from \$47m on turnover which rose to £1.72bn from £1.21bn. The first full contribution from Erb Lumber, acquired last September, was £13.8m.

Mr Lancaster said that Erb and Carolina Builders, both

lumber distributors, had been "on a roll for two years" with 30 per cent per annum sales growth.

In Europe profits from building distribution improved to £92m from £57.1m on sales of £1.14bn, compared with £1bn.

The UK, where the group has 444 outlets, performed strongly, but Wolseley warned that economic recovery in the UK was fragile, and it was impossible to predict the housing market.

The manufacturing division lifted profits to £36.6m from £26.8m on turnover of £390.3m compared with £278.5m. This included a good first full contribution from Enertech, the Swedish oil- and gas-burner manufacturer.

Net debt at the end of the year fell to £56.3m, compared with £62.3m, leaving gearing at 10.1 per cent from 14.7 per cent.

Earnings per share were 50.77p, against 33.80p. A final dividend of 12p a share is proposed, taking the total for the year to 18.72p. The board is also proposing a one-for-one scrip issue.

Lex. Page 16

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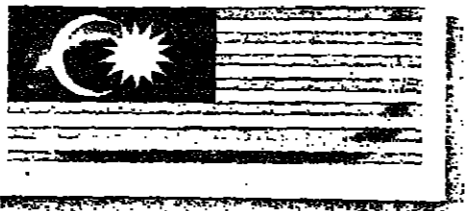
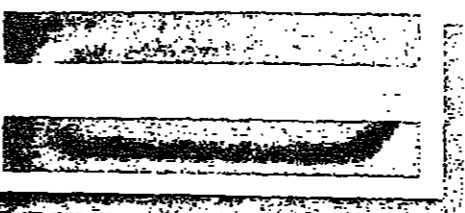
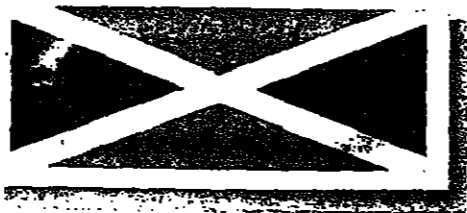
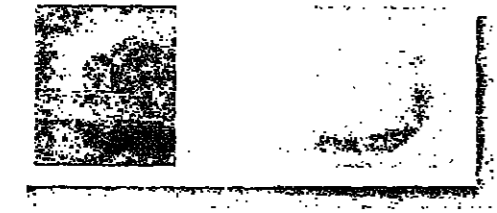
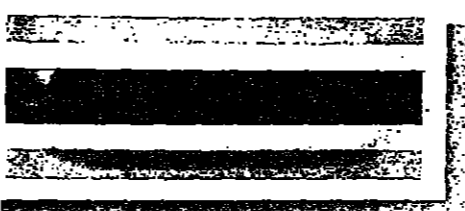
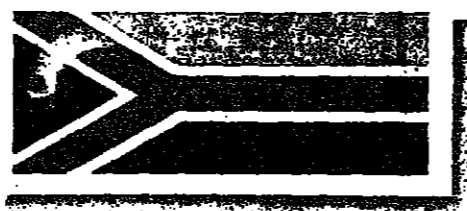
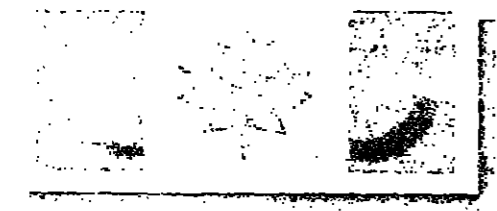
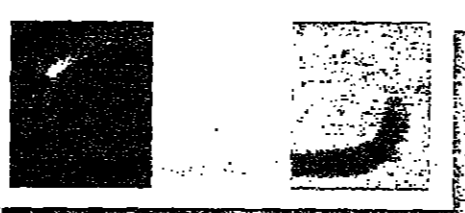
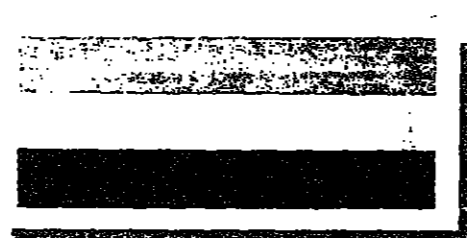
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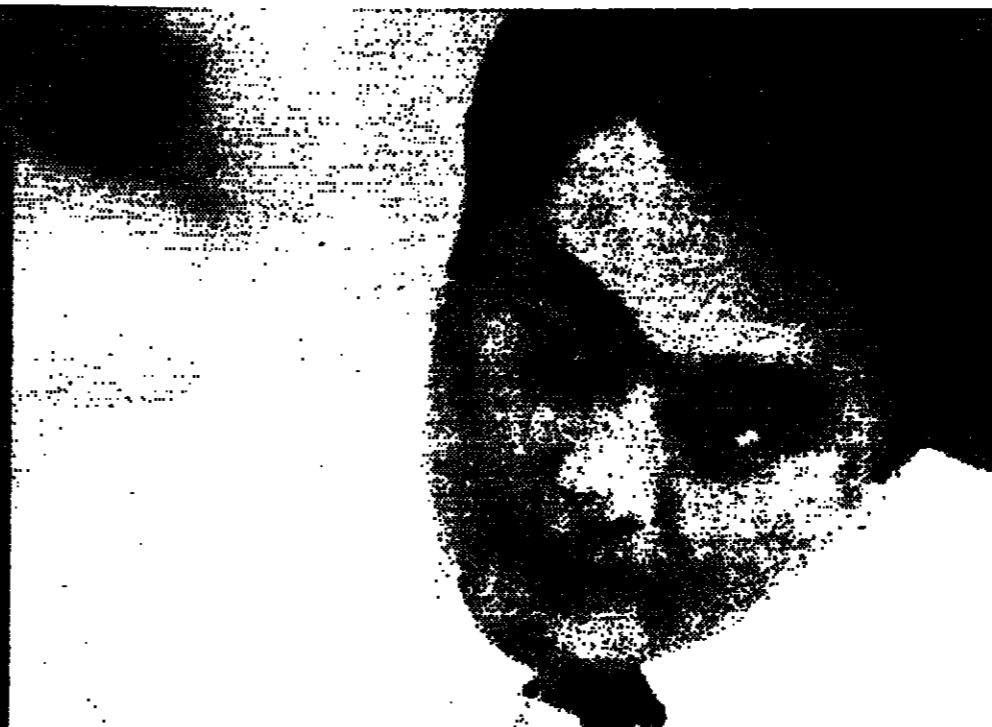
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## INTERNATIONAL COMPANIES AND FINANCE

## Mixed quarter at US energy groups

By Richard Waters  
in New York

Texaco, the US energy group, reported higher operating earnings for the third quarter as a recovery in its international exploration and production business more than made up for the industry-wide slip in downstream refining and marketing profits in recent months.

Chevron, meanwhile, saw operating earnings drop in both upstream and downstream operations. Earnings reports from the big US oil groups this week have generally reflected an increase in earnings from exploration and production on

the back of higher oil prices. Profit margins from refining and marketing, although below the high levels of a year ago, have caused less damage to earnings than generally expected, giving a fillip to oil stocks.

Texaco's shares climbed \$1 1/4 to \$63 3/4, yesterday morning, while Exxon was up \$1 1/4 to \$60 1/4.

Shares in Mobil, meanwhile, jumped by \$2 to \$53 1/4, following an announcement that the company was moving ahead with a restructuring programme to reduce costs.

At Texaco, international exploration and production profits rose to \$33m from \$15m a year ago (before one-off

items). This was due to higher production of both oil and natural gas in the UK sector of the North Sea, lower exploration expenses and higher oil prices, the company said. Upstream income in the US slipped from \$138m to \$127m.

Marketing and refining profits, meanwhile, slid from \$200m to \$167m.

After one-off items in both periods, Texaco reported net income of \$251m, down from \$317m in the 1993 period. At 98 cents a share, earnings were well ahead of most forecasts.

Chevron, meanwhile, said earnings in upstream operations fell from \$322m to \$255m in the latest period, while downstream businesses

recorded a fall from \$248m to \$182m (all figures are before one-off items).

Although operating earnings rebounded from the second quarter, benefiting from higher refined product margins in the US and the absence of refinery operating problems, overall profit margins fell short of the strong 1993 third quarter, said Mr Ken Derr, chairman and chief executive.

One bright spot was provided by Chevron's chemical business, which reported earnings of \$68m, up from \$6m a year ago. Net income overall was \$425m, or 65 cents a share, compared with \$420m, or 64 cents a share, in the 1993 period.

## MAN truck unit in red but sees profit ahead

By Kevin Dore,  
Motor Industry Correspondent

MAN Nutzfahrzeuge, the German truck maker, suffered a pre-tax loss of DM80m (\$53.44m) in the year to the end of June, but the company forecast yesterday that it would return to profit in the current year.

Its profitability has declined during the past three years, with last year's loss following pre-tax profits of DM61m in 1992-93 and DM506m in 1991-92.

The group, the second largest German truck maker after Mercedes-Benz, has been hit by recession in the European truck market. It fell to a net loss in 1993-94 of DM97m from net profits of DM32m a year earlier.

However, the company has restructured and Mr Rudolf Rupperecht, chief executive, said yesterday that the group had been operating profitably in recent months.

Mr Rupperecht said that truck prices had dropped dramatically last year, cutting earnings by DM300m, while the drop in sales volumes cut profits by a further DM200m.

MAN Nutzfahrzeuge, a subsidiary of MAN, the German engineering group, had reduced its overhead costs by DM100m last year, said Mr Rupperecht.

Production fell by 10 per cent to 32,500 - it has fallen by 22 per cent from 41,600 in 1991-92 - while group turnover fell by 5 per cent to DM6.9m.

MAN truck sales in west Europe declined by 15 per cent last year to 26,500 from 31,200 a year earlier reducing the group's market share from 14.5 to 13.5 per cent.

MAN is planning to re-establish the production of trucks and buses in Turkey following the failure of an earlier venture. It is investing DM20m to acquire a 33 per cent equity stake and take management control of Manas, a company in which Isbank, the Turkish bank is the majority shareholder.

## Telmex shares tumble as results disappoint market

By Damien Fraser  
in Mexico City

The stock price of Telefonos de México (Telmex), the country's telephone monopoly and largest private company, fell sharply yesterday morning after it reported worse-than-expected net profits of 7.14bn pesos (\$2.09bn) in the first nine months of the year, an increase of just 1.5 per cent compared with the same period in 1993.

Third-quarter profits rose by 5.5 per cent to 2.6bn pesos. Telmex "L" shares were down 6.9 per cent in late morning trading. The poor results,

along with others reported by Mexican companies, led to a 4.1 per cent fall in the Mexican stock market at mid-day.

The company's profits were dragged down by a 29.2 per cent rise in operating costs over the nine months, mainly accounted for by the increased cost of maintenance and the investment in substituting analogue lines with digital ones. The rise in costs caused the operating margin to fall to 41.7 per cent.

Financial costs were also up sharply, largely due to the depreciation of nearly 10 per cent of the peso against the US

dollar, which led to a reported exchange loss of 978m pesos. Overall the company posted a financial loss of 582.5m pesos in the first nine months of the year.

Revenues reached 21.37bn pesos in the first nine months of the year, an 11.8 per cent rise. The increase was attributed to the 12.4 per cent growth of lines in service and an increase in volume of long-distance and local telephone traffic.

Telmex's cellular subsidiary reported another strong quarter, with the number of users increasing 31.9 per cent.

## Shell Canada ahead sharply at nine months

By Robert Gibbons in Montreal

Strong domestic and export markets for chemicals, oil and natural gas and sulphur brought a sharp turnaround in Shell Canada's third-quarter and nine-month results.

Net profit in the third quarter was C\$89m (US\$65.81m), or 79 cents a share, up from C\$7m, or 1 cent (after a C\$32m special charge), in the 1993 period. Revenues for the company, a subsidiary of the Royal Dutch Shell group, were C\$1.35bn against C\$1.17bn.

Nine months' profit was C\$217m, or C\$1.93, up from C\$13m, or 11 cents, on revenues of C\$3.7bn against C\$3.48bn. Cash flow from operations was C\$61m against C\$37m.

The resource sector provided most of the gain, but refining margins recovered and a sharp rise in contributions from chemicals came mainly from stronger styrene prices.

Canada's biggest integrated oil company Imperial Oil (70 per cent owned by Exxon of the US) posted third-quarter net profit of C\$171m, or 88 cents a share, up from C\$84m, or 43 cents, a year earlier, with better upstream and downstream contributions. Nine months' profit was C\$355m, or C\$1.33, up 15 per cent from a year earlier. Revenues were C\$5.67bn, little changed.

## Sandoz sales growth held to 3% by strength of Swiss currency

By Ian Rodger in Zurich

Sandoz, the Swiss pharmaceuticals, nutrition and chemicals group, said consolidated sales rose only 3 per cent in the first nine months of the year to SFr11.89bn (\$9.53bn), with reported growth restrained by the strength of the Swiss franc.

Sandoz, which acquired Gerber Products, the leading US baby food supplier, for \$2.7bn in August, said group sales growth in local currencies was about 9 per cent. The group expected a "sound improvement" in operating income in the full year.

However, because of weaker financial income, it reiterated its earlier forecast that net income would only be at about last year's SFr1.7bn.

In the third quarter, group sales were up 5.4 per cent at SFr3.67bn, with all of the increase coming from the inclusion of SFr1.90m from Gerber since August 25.

Mr Raymond Breu, finance director, said the cost of the Gerber acquisition would not dilute earnings either this year or in 1995.

The nutrition division, into which Gerber has been integrated, saw its third-quarter sales soar 68 per cent to

SFr719m. Mr Breu said if Gerber and two large acquisitions from last year were excluded, the division was still growing at about a 6 per cent rate.

The pharmaceuticals division suffered a 2.7 per cent drop in sales in the third quarter to SFr1.79bn. But Mr Breu said the underlying trend was up 3 per cent in local currencies, slightly ahead of the industry average.

Sales in the agrochemicals division dropped 5 per cent in the third quarter to SFr1.75bn but in the nine months this has been the group's fastest growing division, with sales up 10 per cent in local currencies.

## Edgars earnings advance 25%

By Mark Suzman  
in Johannesburg

Attributable earnings at Edgars, the South African retail clothing group, grew 25 per cent for the six months to the end of September to R125.6m (\$35.8m) from R110.3m for the same period last year.

Sales rose 16 per cent to R1.92bn from R1.65bn, an improvement due largely to the successful launch of new credit lines to consumers. Trading profit rose 15 per

cent to R235.6m from R204.2m, while financing costs dropped slightly to R27.5m from R28.3m.

All the group's divisions performed well, with flagship Edgars contributing the bulk of sales. These improved 15 per cent, to R1.27bn from the R1.1bn reported last year.

Jet, which is targeted at the lower end of the market, had a very good half, raising sales by 30 per cent to R236.3m from R181.4m.

Sales House, the group's other leading division, raised

sales 12 per cent to R365.3m from R342.5m.

The group attributed the good results to the improved economic climate after the elections in April, and predicted that sales and profits for the full year would be broadly in line with the interim results.

The interim dividend was raised 24 per cent to 56 cents, but the group announced that this would be made in the form of a capitalisation share award unless shareholders requested cash.

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August 1994



All of these securities having been sold, this announcement appears as a matter of record only.

New Issue

US\$1,161,572,125

**INDOSAT**362,425,000 Shares  
Common Stock

The New York Stock Exchange symbol is IIT

Global Coordinators:

**Merrill Lynch & Co.****P.T. (Persero) Danareksa**6,471,876 American Depositary Shares  
Representing 64,718,760 Shares of Common Stock

The above shares were underwritten outside the United States, Canada, Asia (including Indonesia), Australia and New Zealand by the following group of International Underwriters.

**Merrill Lynch International Limited****P.T. Danareksa Sekuritas****CS First Boston****Goldman Sachs International****Lazard Frères et Cie****N M Rothschild and Smith New Court****ABN AMRO Bank N.V.****Barclays de Zoete Wedd Limited****Cazenove & Co.****Credit Lyonnais Securities****Deutsche Bank**  
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Representing 129,437,500 Shares of Common Stock

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103,550,000 Shares of Common Stock

The above shares were underwritten in Indonesia only, with the following as representative of the Lead Managing Underwriters.

**P.T. Danareksa Sekuritas**

Joint Advisors to the Government of the Republic of Indonesia

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## COMPANY NEWS: UK AND IRELAND

## Lep acts to cut £340m debt

By Tim Burt

Lep Group, the loss-making freight forwarding and security company, has begun intensive talks with its lenders in a bid to reduce its £340m debt.

The group - restructured in 1992 in one of the UK's largest debt-for-equity swaps - admitted yesterday that its core businesses could no longer service interest payments, which totalled £16.1m (£17.5m) in the six months to June 30.

Mr David James, the company director appointed chairman by the banks two and a half years ago, said the company was anxious both to reduce £169m of "dead debts" from discontinued businesses and to refinance National Guardian Corporation (NGC), its US security business.

"The company is addressing these problems with our banks but it could be a year before

the discussions are completed," Lep's bankers currently hold 85 per cent of the equity, which they exchanged for £180m of debt two years ago when group borrowings stood at £630m.

Although the group has reduced borrowings through a series of disposals, including the £89m sale earlier this year of Swiss Bank House in London, Mr James said the core businesses could only afford interest payments on the £148m portion of the debt which they used for working capital.

Their ability even to meet these payments was hampered in the first half by £292m of exceptional charges covering restructuring, litigation costs and the security division's withdrawal from its special engineering business.

Those charges helped cut operating profits from £14.3m to £9.5m. Interest payments, a



David James: no dividend in foreseeable future

£2.57m provision for loss on the disposals and a £1m loss on the closure of Lep Industrial Holdings together contributed to increased pre-tax losses of £3.68m (£5.05m). Turnover was up at £723m (£703m).

Mr James said the core

security and freight forwarding businesses remained profitable, but their performance had been undermined by a series of "disastrous" acquisitions in the 1980s.

"Our strategy has been to get rid of anything which is not fundamental to our two main activities," he added.

The group said it would sell its distribution business, supplying mainly automotive components, "within a few weeks" and was determined to further restructure its freight forwarding business.

It also predicted that it would agree a refinancing package for NGC in the first quarter of next year.

Losses per share increased from 0.7p to 1.1p, and with no funds to pay a dividend, Mr James warned: "There can be no expectation of a dividend payment in the foreseeable future."

## EIT net assets fall 4.5%

By James Buxton, Scottish Correspondent

Edinburgh Investment Trust, one of the largest UK investment trusts, reported a fall of 4.5 per cent to 336.9p in net asset value per share in the half year to September 30.

The fall exceeded the decline of 3.3 per cent in the FT-SE All-Share Index over the period and meant that the trust did not achieve one of its regularly stated objectives.

However, EIT, managed by Dunedin Fund Managers, achieved its other stated objective of producing dividend growth ahead of UK inflation. It declared an interim dividend of 3.05p (2.99p) - a 3.4 per cent increase compared with a rise in retail prices of 2.2 per cent.

Earnings per share fell from 5.77p to 5.35p, as a result of switching part of the gilt portfolio into lower yielding equities in the latter part of last year, as well as the timing of some dividend receipts.

However, dividend growth from underlying investments exceeded expectations and the directors are confident of being able to increase the final dividend.

## Guardian Media shows 45% advance to £16.7m

By Raymond Snoddy

The Guardian Media group, publishers of The Guardian, The Observer and the Manchester Evening News, yesterday announced a 45 per cent increase in interim pre-tax profits.

The increase for the six months to October 1 - from £11.5m to £16.7m - exceeded pre-tax profits for the last full year.

Turnover was up from £122m to £143m.

Mr Harry Roche, chairman and chief executive of the Guardian Media Group, con-

ceded that the results reflected the decision to take the full costs of redundancy and integration of The Observer purchase in last year's figures.

All the company's operations - including broadcasting, publishing and local newspapers - were showing strong growth.

"We are very happy to have maintained the sale of our national newspapers without having to resort to cover price reductions," said Mr Roche.

"But we take a cautious view of the future, given the costs of competing in the market and the projected increases in

newsprint costs," he added.

In the six months to September, The Guardian averaged daily sales of 393,566.

This was a drop of 1.5 per cent, but sales bounced back in September and rose to 410,584, representing an increase of some 6.5 per cent.

The Observer's circulation averaged 387,800 for the six months, representing a drop of 1.8 per cent.

Mr Roche said yesterday the group's balance sheet remained "exceptionally strong".

Further acquisitions were likely as opportunities arose.

## Heart drug buoys sales at Zeneca

By Tim Burt

Zeneca, the agrochemicals and pharmaceuticals group, reported an 8 per cent increase in turnover from £3.2bn to £3.45bn in the first nine months of this year.

Demand for Zestril, its best-selling heart treatment, helped lift turnover in the pharmaceutical division from £1.36bn to £1.48bn.

Sales growth in the final quarter is expected to fall back slightly as the benefits of the Zestril Incentive Patient Programme - its response to aggressive pricing by rival drug companies - starts to wane. The programme prompted a wave of purchases in July and August.

Reporting its first nine-month sales figures since its demerger from ICI in June last year, the group said the agrochemicals division enjoyed increased turnover of £1.21bn (£1.12bn) following strong sales in North America and "an encouraging start" to the season in Latin America.

The group lost £29m in contributions from businesses sold off during the past year, mainly in the specialties division which manufactures coatings and resins.

## ScotMet returns to the black

By Richard Wolfe

Scottish Metropolitan, Scotland's largest property company, yesterday announced a turnaround to pre-tax profits of £11.3m for the year to August 15, against losses of £1.78m.

The recovery was underpinned by a 44 per cent reduction in interest costs from £15.9m to \$9m and a \$5.56m gain on the sale of investment properties.

Operating profits shrunk to £14.7m (£17.6m) as net revenue from properties fell to £16.3m (£19m) after a \$35.9m net

disposal of properties.

Mr Scott Cairns, managing director, said the company would improve net revenue by reducing its level of vacant properties.

"We are still running with higher than average voids in the sector," he said. "We do not expect a lot of help from the letting market in the next 12 months, but we still expect to reduce the level of vacant properties."

The company also aims to increase its portfolio of Scottish property, particularly in the industrial sector, and

further reduce its office property.

Gearing fell from 181 per cent to 51 per cent as borrowings were cut from £144.9m to \$79.2m by the year-end.

During the period a rights issue raised £26.8m net of expenses. A £18.8m surplus on valuation of investment properties also helped to lift net asset value per share from 81.7p to 99.3p.

Earnings per share stood at 8.82p after 2.13p losses last year. A recommended final dividend of 1.5p makes a total of 2p (1.5p).

## Salomon has 7.3% of Attwoods prefs

Salomon Brothers, the US investment bank, has become a preferred shareholder in Attwoods, the waste management company fighting a £364m bid from Browning-Ferris Industries of the US.

After buying 1m preference shares at 38½p last week, Salomon disclosed yesterday that it had paid a further £3.2m for 3.64m prefs, at 88p, bringing its stake to 7.3 per cent. This is 3p higher than BFI's offer.

Salomon bought some of the prefs from Fidelity Investments, which remains a substantial ordinary shareholder.

A successful BFI would have the right in certain circumstances to demand early conversion of the prefs, or redemption at 100p. Laidlaw Canada has agreed to sell its 73 per cent prefs stake to BFI.

## Euclidian unveils £20m placing

By Ralph Atkins, Insurance Correspondent

Euclidian, one of the latest batch of corporate vehicles planning to invest in the Lloyd's of London insurance market, yesterday announced details of its proposed £20m stock market placing.

It hopes to attract investors with its high gearing and by participating in a wide spread of syndicates in 1995. Impact day has been set for November 15.

Euclidian has agreed a gearing and risk-sharing agreement with Centre Re, the Bermuda reinsurer subsidiary of Zurich Insurance. Under the deal, Centre Re will make available £20m in funds at Lloyd's.

That will allow Euclidian to underwrite insurance policies paying premiums of £80m, four times the gross capital raised.

Centre Re will buy 5 per cent of Euclidian's ordinary shares.

Euclidian plans to place funds with up to 65 Lloyd's syndicates, selected by Indemnity Insurance Services, the broker and Lloyd's adviser.

Mr James Stuart, joint managing director of IS, are directors of Euclidian.

Britain, which included the first full year contribution from Pertwee and Parson, two fertiliser businesses bought in 1992. There was also a half year contribution from Nordos, a fishmeal company purchased in February for £2m.

The Irish operations, which include the manufacture of food ingredients, animal feed and fertiliser blending and distribution, all performed well, according to Mr David Martin, finance director.

Cash flow from operating activities was £23.5m, allowing the group to reduce borrowings from £19.5m to £1.9m, bringing

interest charges down from £5.9m to £1.6m. Gearing stands at 4 per cent.

Both the Nordos purchase and a £3.2m acquisition in July of the Malling Company of Ireland were funded out of cash flow and further bolt-on acquisitions in Britain, funded in the same way, are being considered, Mr Martin added.

IAWS is carrying out due diligence on United Fish Products in Scotland, for which it has bid £11.8m.

Earnings per share were up 16 per cent to 8.7p; a proposed final dividend of 1.265p lifts the total by 15 per cent to 2.415p.

## LMS buys shopping arcades

By Richard Wolfe

London Merchant Securities, the property and investment company, has acquired Arcadia, a private company with a portfolio of Victorian shopping arcades.

LMS acquired an 80 per cent stake in Arcadia by providing £14.5m of five year redeemable loan stock. The capital will clear Arcadia's bank borrowings of about £10m and enable the purchase of further shopping centres.

In exchange, Arcadia has taken over a £2m portfolio of four LMS retail properties

across the UK which are expected to be sold on.

Mr Robert Spier, LMS finance director, said: "We were looking to expand our retail interests, which are very much larger. Arcadia is going to stick to this type of business, rather than going into big shopping centres."

Arcadia was formed in 1986 to manage arcade properties in Cardiff, Walsall and Stirling, with its revenue mainly deriving from independent retailers

on short-term leases or licences.

The remaining 20 per cent of Arcadia shares will be held by Mr Peter Smith, who founded the company, and Mr Rod Pearson, former managing director of Raglan Property Trust. Mr Nicholas Driver and Mr Robert Rayne, directors of LMS, will join Arcadia's board.

LMS reported a 20 per cent drop in pre-tax profits to £22.3m last year. Its properties were valued at £379.5m.

## Stakis buys London hotel

Stakis, the Glasgow-based hotel group, has bought Renhotel (UK) for £6.1m cash. Renhotel's only asset is the 92 bedroom Harwood Hotel, opposite Marylebone Station in central London.

Some £5m of the consideration is repayment of debt. A further £200,000 is payable in respect of working capital.

The hotel, to be known as the Stakis London Harwood, brings the group's total to 37 hotels and 22 casinos throughout the UK. The group announced a £10.4m pre-tax profit at the beginning of the year, turning round from losses of £47.7m after two years of restructuring and disposing of Ashbourne Holdings, its nursing home operations.

"Despite the increasing buoyancy in the London hotel market, this deal proves that it is possible to find good buying opportunities," said Mr David Michels, chief executive.

Retail lifted sales by some 8 per cent to £23.1m, but the sports side suffered from pressure on margins while the product mix on the outdoor operation was affected by the hot summer.

However, the second half had started well, Mr Bentley said. New stores had opened in Chester and Glasgow with others set to open in Worcester and Kingston by the year-end.

Distribution reported reduced operating deficit on sales ahead 35 per cent to £2.4m with good showings by the Miss Sam and O'Neill businesses. The troublesome Fila distributorship performed "satisfactorily" with increased orders for the second half.

The shares fell 3p to 31p, valuing the company at just under £10m.

Boxmore Intl

Boxmore International, the Northern Ireland-based plastic packaging manufacturer which expanded into mainland Britain this year, announced interim pre-tax profits ahead 38 per cent from £2.72m to £3.73m.

Mr Harold Ennis, chairman, said all operations had performed well. Turnover for the six months to June 30 increased by 36 per cent to

£23.1m (£17m) and operating profits were 44 per cent up at £3.56m (£2.47m). He warned, however, that "substantial raw material price increases" had affected selling prices.

USM-quoted Boxmore acquired Label Research, a pharmaceutical labels maker, in February for up to £13.4m, most of which was raised by a share placing. The acquisition contributed £2.5m to sales and £701,000 to operating profits.

Because of the additional equity and increased tax, earnings per share advanced by just 16 per cent to 10.5p (9.4p).

The interim dividend is lifted 10 per cent to 1.375p (1.25p).

Ocean Wilsons

Pre-tax profits at Ocean Wilsons Holdings fell 26 per cent from £3.09m to £2.28m in the six months to June 30.

Turnover at the investment holding and shipping company rose from £46.4m to £58.1m, an increase of 25 per cent.

Earnings per share were 4.33p (4p) and the interim dividend is unchanged at 1p.

DIVIDENDS ANNOUNCED					
	Current payment	Date of payment	Corresponding dividend	Total for year	Total last year
Black & Leisure	0.75	Feb 3	0.75	-	2.25
Boxmore Intl	1.375p	Dec 8	1.25	-	4
Bradford Prop	3.2	Jan 5	2.9	-	8.5
Edinburgh Inv	3.05	Dec 2	2.95	-	8.75
Contra-Cyclical	2.25	Nov 30	nil	-	nil
IAWS	1.265p	-	1.1	2.415	2.1
McAuliffe	9.75p	Jan 28	9.75	14.75	14.75
Ocean Wilsons	4.33p	Nov 30	1	-	4
Scottish Metro	1.5p	Jan 6	1.1	2	1.5
Sunset + Vine	2.5	Dec 8	2	4	3.5
UDO	5.78p	Dec 9	5.13p	7.2	-
Wolseley	12p	Jan 31	9.75	16.72	13.3

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## PAN - HOLDING

As of October 15, 1994, the unconsolidated net asset value was USD 355,548,915.29, i.e. USD 648.46 per share of USD 200 par value.

The consolidated net asset value per share amounted as of October 15, 1994 to USD 682.23.

## LEGAL NOTICES

In the High Court of Justice Chancery Division

IN THE MATTER OF TLO plc and THE COMPANIES ACT 1985

NOTICE IS HEREBY GIVEN that a Petition was presented to the High Court of Justice for the confirmation of the reduction of the share premium account of the above-named Company by £25,763,000.

AND NOTICE IS FURTHER GIVEN that the said Petition is directed to be read before Mr Registrar Baskley at the Royal Courts of Justice, Strand, London WC2A 2LL on Wednesday, 26th November 1994.

ANY CREDITOR or shareholder of the said Company desiring to oppose the making of an Order for the confirmation of the said reduction of the share premium account should appear at the time of the hearing in person or by Counsel for that purpose.

A copy of the said Petition will be furnished to any such person requiring the same by the undersigned solicitors on payment of the regulated charge for the same.

Dated 24th October 1994

Arthur Morris Crisp Broadbent House 5 Appold Street London EC2A 2BA Tel: 071 436 1111 Ref: SA/WJW Solicitors for the said Company

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FT Surveys

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This advertisement does not contain any information about The HSBC China Fund Limited ("The Company") other than the information set out below and should therefore be read in conjunction with the listing particulars relating to the Company dated 26th October 1994 (the "Listing Particulars").

Applications have been made to the London Stock Exchange for the Ordinary Shares and Warrants of the Company to be admitted to the Official List.

It is expected that Listing will become effective and dealings in the Ordinary Shares and Warrants will commence on 23rd November 1994. The Ordinary Shares and Warrants are already listed on The Stock Exchange of Hong Kong Limited.

## THE HSBC CHINA FUND LIMITED

(Incorporated as an exempt company in the Cayman Islands with limited liability. Registered number 411127)

Introduction to The London Stock Exchange of 54,009,600 ordinary shares of US\$0.01 each and 1,798,400 Warrants (each entitling the holder to subscribe for six Shares)

Sponsored by James Capel & Co Limited

The HSBC China Fund Limited is an investment company incorporated in May 1992 to provide investors with a vehicle to benefit from emerging investment opportunities in China.

The investment objective of the Company is to achieve long term capital appreciation through investment in equities and other securities with significant growth potential, which derive a significant part of their revenue from China.

Copies of the Listing Particulars are available for collection from the Company's Administrative Office, The London Stock Exchange, Stock Exchange Tower, Capel Court, Leadenhall, off Bartholomew Lane, London EC3R 6AF on 26th and 27th October 1994. Copies of the Listing Particulars are also available from James Capel & Co. Limited, 26th October 1994.







## CHEMICALS

	Notes
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ICI	
Inspect	
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Midland Russell	
Metropolitan Ind	
Parsons City	
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Schulze Speck	
Shaw	
Woolington	
Woolworths	
Yule Corp	

## DISTRIBUTORS

YE	ASB Labs	Motes
10	Alcans	17%
10	Adams & Harvey	24%
10	Alcan Labs	24%
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99	Alcan Labs	24%
100	Alcan Labs	24%

Electrocomp	\$M	48
Electron House	\$M	125

[illegible]Hatch Wimp HCS ☐[illegible]

## EXTRACTIVE INDUSTRIES

[illegible]

Isotomin Res AS	281	+1	37
Isotomin CS	605	-4	837

1	Alabama	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	2906	2907	2908	2909	2910	2911	2912	2913	2914	2915	2916	2917	2918	2919	2920	2921	2922	2923	2924	2925	2926	2927	2928	2929	2930	2931	2932	2933	2934	2935	2936	2937	2938	2939	2940	2941	2942	2943	2944	2945	2946	2947	2948	2949	2950	2951	2952	2953	2954	2955	2956	2957	2958	2959	2960	2961	2962	2963	2964	2965	2966	2967	2968	2969	2970	2971	2972	2973	2974	2975	2976	2977	2978	2979	2980	2981	2982	2983	2984	2985	2986	2987	2988	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Hunting	100	-1	286	159	156.7
8 1/2" DG Cr Pl	92nd	-2	146	91 1/2	44.1

[illegible]

4.5	10.9	UMECO	2N	63	-1	71	39	8.7
3.5	11.2	Ind Industries	2 7/8	15 1/2	—	18 1/2	12	34

	Price	Notes	Price	Notes
12.1	12.1	White Oak	672	672
12.2	12.2	Color	684	684
12.3	12.3	Color	684	684
12.4	12.4	Color	684	684
12.5	12.5	Color	684	684
12.6	12.6	Color	684	684
12.7	12.7	Color	684	684
12.8	12.8	Color	684	684
12.9	12.9	Color	684	684
13.0	13.0	Color	684	684
13.1	13.1	Color	684	684
13.2	13.2	Color	684	684
13.3	13.3	Color	684	684
13.4	13.4	Color	684	684
13.5	13.5	Color	684	684
13.6	13.6	Color	684	684
13.7	13.7	Color	684	684
13.8	13.8	Color	684	684
13.9	13.9	Color	684	684
14.0	14.0	Color	684	684
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14.2	14.2	Color	684	684
14.3	14.3	Color	684	684
14.4	14.4	Color	684	684
14.5	14.5	Color	684	684
14.6	14.6	Color	684	684
14.7	14.7	Color	684	684
14.8	14.8	Color	684	684
14.9	14.9	Color	684	684
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15.1	15.1	Color	684	684
15.2	15.2	Color	684	684
15.3	15.3	Color	684	684
15.4	15.4	Color	684	684
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15.7	15.7	Color	684	684
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16.3	16.3	Color	684	684
16.4	16.4	Color	684	684
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16.6	16.6	Color	684	684
16.7	16.7	Color	684	684
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16.9	16.9	Color	684	684
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17.2	17.2	Color	684	684
17.3	17.3	Color	684	684
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17.5	17.5	Color	684	684
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17.7	17.7	Color	684	684
17.8	17.8	Color	684	684
17.9	17.9	Color	684	684
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18.6	18.6	Color	684	684
18.7	18.7	Color	684	684
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19.4	19.4	Color	684	684
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19.6	19.6	Color	684	684
19.7	19.7	Color	684	684
19.8	19.8	Color	684	684
19.9	19.9	Color	684	684
20.0	20.0	Color	684	684

### **ASSIGNMENT TRUSTS - Cont.**

[illegible]

— 2 —

[illegible][illegible]

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237	1155	84.5	74.4	101.1
238	1159	84.5	74.4	101.1
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241	1171	84.5	74.4	101.1
242	1175	84.5	74.4	101.1
243	1179	84.5	74.4	101.1
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255	1227	84.5	74.4	101.1
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257	1235	84.5	74.4	101.1
258	1239	84.5	74.4	101.1
259	1243	84.5	74.4	101.1

**INVESTMENT TRUSTS - Cont.**LEARNING OBJECTIVES: 3.0

**ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED**

**References**

**Table 1**

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**OTHER INVESTMENT TR**

MAN	20	52	110
Metals Bulletin	51N	478	482
Metals Weekly	3-14	288	142

Highland MS	1042	+2	118	66	628.5	2.7	3
Homstock	248	-1	282	234	58.5	3.0	1

Specialty Soaps	<input type="checkbox"/>	107
Starbuck	<input checked="" type="checkbox"/>	12
Stamps & Mfg	<input type="checkbox"/>	503

Notes	Price	+ or -	100
			high

TVK Gold	402.2
Toronto-Dom	9.2
Town Can Pine	9.2

as a guide only. See guide to London Share Service

Telegram \_\_\_\_\_  
 Times \_\_\_\_\_

Calculus	219	+1	230	191	232	-
Calculus	90	-	151	89	81.2	-
Exam II	223.2	+1	230.2	221.2	230.2	-

Johnson's	<input type="checkbox"/>	74
Doherty Farm S.	<input type="checkbox"/>	801
Garrett	<input type="checkbox"/>	364

Compu link	35	74
Cable MTR test	4	6

Symbols referring to dividend and  
total return, and P/E ratios. P/E

## LEISURE & HOTELS

9500 Gm Pt. 1004 14 207 1/2  
Mtd & Sent 3 9 9 1/2

Shallow (m)	118	122	75	63.4	4.0
Silt/clay	102.2	102	102	131.7	7.2
Sand (m)	120	123	308	818.2	2.8

7-20 Can PL\_\_\_\_\_ 200-2-21

Applied Electron. 3-1981	167ad	—	167
Assoc. Br. Ports. 3-1981	279ad	-B	*3132
RAA 1981	287	-B	*3132

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Financial Title

## NYSE COMPOSITE PRICES

**4 pm close October 25**

[illegible]**NASDAQ NATIONAL MARKET**

4 077 closed October 30

[illegible]



# TECHNOLOGY IN THE OFFICE

Wednesday October 26 1994

While the PC has become the leading agent for change, Paul Taylor finds that office equipment is combining features to become multi-functional

## System distinctions begin to vanish

Digital technology is transforming the way companies do business. This is most evident in the office where networks of powerful personal computers, wireless telephony and high-speed communications links are reshaping the way we work.

Data processing and digital telecommunications in particular have changed the way information is collected, manipulated, analysed and stored. Now these technologies are converging, bringing the integrated digital office closer.

In the process they are enriching the office environment by bringing new value-added services, such as video-conferencing, electronic mail, electronic data interchange (EDI) and multimedia, to the desktop.

The most dramatic change since the early 1980s has been the arrival of the personal computer and workstation. Today an estimated 100m PCs and workstations are in use across the globe. Each new microprocessor generation brings more power to the desktop at the same or lower prices. The accelerating pace of silicon engineering means that most desktop machines now have the power and storage capacity of yesterday's mainframe machines.

Such high performance machines are required to handle the sophisticated and power-hungry software developed by Microsoft and others.

Increasingly these PCs are hooked together using hardware and wireless telecommunications links to form local and wide-area networks (Lans and Wans), which can share data and peripherals like printers, computer-based fax

machines, scanners and other equipment. This process of computer platform substitution - from mainframe to desktop PC and mid-range machines called "servers", has become known as "downsizing", or "rightsizing".

The fact that the PC has become an indispensable business tool and an agent for change in the workplace is reflected in a study\* of the European market undertaken by Context, an IT research firm, and published recently by the Economist Intelligence Unit.

The authors note that in spite of recession and cut-backs, the PC market has grown by 12.5 per cent in unit terms in 1992 and by about 14 per cent in 1993. "Projections for 1994 are that demand will continue to rise and that unit growth could increase by more than 20 per cent on 1993," the report says.

"The reasons for this sustained growth are simple. Business in the 1990s cannot compete without the efficiency and technology provided by computers. The PC best fulfils these requirements in a form that is versatile, flexible, powerful and, most important of all, affordable. The massive price reductions of the past two years have played a vital part in promoting continued growth in the sale of PCs."

The PC may have improved office productivity, but it has not led to the creation of the paperless office some had predicted. At least 80 per cent of information used in the office is still stored on paper, rather than electronically.

The growing use of electronic-trading and EDI in the UK and elsewhere has begun

to cut into the stacks of documentation which business transactions generate, but progress is slow.

In the US more than a third of companies are expected to buy document management systems this year and new hardware such as digital optical scanning, storage and retrieval devices have begun to appear in offices.

But so, too, have new paper generators such as high-volume electronic demand printers which link directly to computers, digital offset presses and digital copiers which scan a hard copy once and allow image manipulation before reproducing multiple copies.

Other digital multi-functional office equipment is also beginning to appear, blurring of distinctions between individual devices. Most of these devices combine some or all of the features of a facsimile machine, photocopier, laser printer and scanner.

Meanwhile, other bottlenecks in the office communications infrastructure have been attracting attention. In particular the lack of flexibility, inefficiencies and unnecessary costs imposed by hard-wired telecommunications links are being challenged by new wireless alternatives - in much the same way that cellular telephones and mobile data have begun to change perceptions of telecommunications outside the office.

A growing number of businesses are using digital cellular telephony, portable computers and mobile data networks to exchange information between the central office database and mobile employees such as salesmen or engineers.

Now within the office, sev-



eral PABX (private automatic branch exchange) manufacturers have launched digital cordless voice systems. Similarly wireless Lans linking desktop computers, workstations and other devices, without the need for fixed cabling have begun to appear.

Meanwhile the volume and variety of information requiring delivery to the desktop is set to grow rapidly as desktop video-conferencing and multimedia applications become increasingly commonplace.

Some computers now come

fully equipped for video-conferencing, allowing users to transmit live video images of themselves to other, similarly-equipped users, and to see on their PC the person they are talking to. But for the moment most PC users will have to buy a special kit if they want to carry out a video-conference in a window on their screen.

In order to deliver these multimedia services across networks, new high speed, high capacity packet-switched technologies, such as ATM (Asynchronous Transfer Mode), have

been developed. As they are adopted, the remaining distinctions between office voice and data lines are likely to vanish.

The rapid pace of change means corporate and other information technology users are having to spend increasing amounts to remain in step with new technology. The annual Price Waterhouse information technology review\*\* published last month and based on a survey of 1,000 information technology executives, found that IT spending jumped by 15 per cent last year

across the corporate sector - a sharp increase given the low inflation rate and far above the 0.2 per cent increase that the same organisations had predicted at the start of 1993.

The survey found IT spending to be closely tied to restructuring. Two-thirds of organisations claimed to have programmes in place and 28 per cent of IT executives said they were themselves the main architect of change in their organisation.

"This study confirms that managers in major companies are now re-thinking their operations and re-equipping their IT systems to fit new market conditions," says Jane Lucien-Scholle, head of the IT practice of Price Waterhouse Management.

The survey also highlights the marked trend away from mainframe-based systems to PC-based client-server networks. Client-server computing was the most popular of the new and emerging technologies and has been implemented by 58 per cent of the respondents and was ranked number one in offering the greatest potential benefit.

Other new technologies popular with the executives included document image processing and workflow systems which are being used by organisations with high volumes of paper which need to be stored such as credit card receipts and cancelled cheques.

"All these findings point in the same direction," says Ms Lucien-Scholle. "Management is looking very deeply into the competitive implications of IT. They want change, but are resisting superficial responses. They are investing, but they also want value."

The ways in which they spend these very large sums and adapt their organisations to exploit new systems are likely to have a critical influence on competitive performance and profits in the years ahead."

\*The European Market for PCs and Printers, Economist Intelligence Unit, 15 Regent Street, London SW1 4LR, 1993. \*\*Price Waterhouse IT Review, Publications Office, Southwark Towers, 32 London Bridge St, London SE1 5SY. Free.

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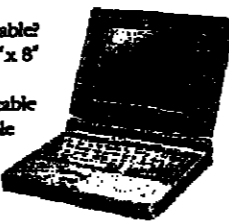
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## TECHNOLOGY IN THE OFFICE 2

Desktop computers: Paul Taylor tries to evaluate the conflicting claims

## Intel against Compaq in bitter battle

Once again, the worldwide personal computer market is in turmoil with leading PC manufacturers slashing prices to keep volumes moving ahead and a bitter public power struggle breaking out between Intel, the world's leading semiconductor manufacturer, and Compaq Computer, its biggest customer.

In mid-August, a new price war erupted in the US personal computer market when International Business Machines slashed prices on many of its PC products by up to 27 per cent. The move came in response to similar price cuts by Compaq, the US market leader.

IBM also cut the prices of its PC network servers to less than those of equivalent Compaq machines. Compaq is the dominant supplier of PC servers, used to control office computer networks. This is the most profitable and fastest growing section of the corporate PC market.

Then last month, in an unprecedented outburst, Eckhard Pfeiffer, Compaq's president and chief executive, lashed out at Intel, accusing the US chip maker of undermining Compaq's marketing efforts and of not giving his company due consideration as the biggest seller of PCs in the US and Europe.

Mr Pfeiffer cited Intel's promotion of its own brand name, chip pricing strategy, and the direct competition posed by Intel's growing PC and circuit board manufacturing operations.

These battles are taking place against

the backdrop of a market which has been underpinned throughout the recession by the continued shift by business customers away from mainframe computers to networks of desktop PCs and mid-range computers (client-server systems).

According to Dataquest, the market research organisation, about 45 per cent of PCs were connected to networks last year, and this is forecast to rise to 55 per cent this year and 77 per cent by 1997. The impact of this trend is apparent in PC volume sales. Despite cutbacks, budget freezes and huge numbers of bankruptcies and redundancies, the European PC market grew by 12.5 per cent in unit terms in 1992 and by about 14 per cent in 1993, according to an Economist Intelligence Unit research report. Projections for 1994 are that demand will continue to rise, with unit growth increasing by a further 20 per cent.

At the same time, there has been a marked resurgence in sales by the large brand name PC manufacturers over the past two years, reversing the trend towards the cut-price "clone" manufacturers apparent since the late 1980s.

The top five PC manufacturers all increased their market shares last year in terms of worldwide shipments, according to Dataquest. In western Europe, shipments by the top nine manufacturers rose by 7.3 percentage points to 54.4 per cent of the total market. Compaq, in particular, has achieved a dramatic turnaround.

## The top five PC manufacturers all increased their market shares last year in terms of worldwide shipments, according to Dataquest

Several factors are responsible. First, the old established manufacturers have hit back at cut-price clone manufacturers with competitively priced machines of their own. Second, the growth of the local area network has placed a premium on PC networking compatibility and on support and service. Finally, customer buying habits for desktop computers have moved back towards established indirect distribution channels.

Meanwhile, PC prices have continued to tumble. According to London-based Mar-

ketline International, the average price of a PC in the UK fell by 18.8 per cent between 1991 and 1993. At the same time, the specifications continue to rise, meaning that entry-level business computers now boast features that were available only on top-level machines a few years ago.

Slim profit margins and shortening product cycles continue to take their toll - there has been a steady stream of casualties on both sides of the Atlantic. Nevertheless, volumes are such that no serious contender in the data processing industry can afford to ignore the PC market.

Fuelling the PC price battle are sharp cuts by Intel in the prices of its microprocessors. The US chipmaker reduced the prices of its 486 and latest generation Pentium chips by about 40 per cent in the second quarter.

More recently, Intel has announced an advertising campaign to persuade business customers and home consumers to buy PCs based on the Pentium chip - sales of which have been slower than expected. This has annoyed Compaq, which had large stocks of machines based on lower performance chips at the end of the second quarter. Compaq sees Intel's attempts to accelerate the pace of technological advance in the PC industry as an intrusion.

For its part, Intel is thought to be marketing Pentium chips aggressively so as to maximise its already strong profit margins, and to outflank mounting competition from rival chip manufacturers which threaten to eat into its 90 per cent market share of world microprocessor sales.

Among the competition, California-based Advanced Micro Devices has already launched versions of Intel's 486 microprocessors and has promised a Pentium clone by the end of the year. Other competitors include Nexgen, a privately-held chip developer in which Compaq has a minority stake, and Cyrix. Market analysts believe these companies could achieve a 20

per cent or higher share of the PC microprocessor market over time.

Meanwhile, both Apple Computer and Motorola, the US electronics and communications manufacturer, have launched PCs based on PowerPC microprocessors chips, jointly developed by the two companies together with IBM.

Its advocates claim the PowerPC microprocessor is more powerful than competing chips from Intel, making them well suited to demanding desktop applications such as multimedia with sound, video and graphics which are beginning to appear in the office.

However, the new chips lack the broad software base available for Intel-based PCs. This is one reason why IBM has delayed the launch of its own version of the PowerPC until early next year.

Lou Gerstner, who took over as IBM chairman 18 months ago, has said that some of IBM's customers are concerned about the rapid obsolescence of the products they buy, and the pace of technological change. However Mr Gerstner has also acknowledged that IBM has often been slower than its rivals to bring new products to market - even when it has a technological lead.

Despite the concerns of both Compaq and IBM, it seems unlikely that the pace of technical innovation will slow. Therefore one of the main challenges facing corporate PC customers will continue to be to sift through the competing claims.

Monica Horten on how to check software piracy and petty thefts

## Why networks need managers

A City of London bank, which recently conducted an audit of its personal computer networks, found 50 megabytes of computer memory were missing. The problem was eventually traced to one of the technical IT staff, who had taken four megabytes of memory out of each new machine that was purchased, and put it into his home computer.

With the price of memory running at £20-100 per megabyte, such petty thefts can cost the business a significant amount of money. Not to mention the loss of capacity on the network, for which the business could also suffer.

The bank's problem is not untypical. According to Adrian Botterill, UK marketing director of network supplier Azlan, many businesses do not know how much equipment is connected to their networks. Often equipment is purchased without any plan or strategy by user departments and the IT department is not consulted. Even in IT, PCs and PC networks tend to be small beside the larger mainframe and mid-range systems and few people bother to keep precise records.

"A lot of companies don't know what networks or

systems they have in use. Individual staff connect PCs to networks with such a degree of freedom that IT departments often don't know what is happening," says Mr Botterill.

Only now are user organisations beginning to realise that PC networks need to be properly managed. Networks are installed to enable staff to be more productive by improving the flow of information within a department or an entire organisation. For example, a sales department is given access across the network to the debtors and creditors list on the accounting system. Sales reps then know which customers they should target for further sales, and which are a bad risk.

These organisations not only risk loss of hardware, but could put in jeopardy those very benefits which they want to achieve, if they fail to look after the equipment. For example, can the network cope if everyone wants to access a

particular application at the same time? What happens if more users are added to the network and traffic increases, causing regular "crashes"?

"Networks are designed to cope with some failures. But you could have a lot of invisible failures, and if you then load the network up with more data traffic, you could go too far and hit a brick wall," says Lee Taylor, of specialists supplier Logical Networks.

Software is available to deal with each of these issues. But no single product copes with the lot all at once. The products fall into two categories: traditional network management software; and a new raft of products designed to manage desktop applications and hardware.

The former includes Sun Net Manager, Hewlett Packard's Open View or IBM's NetView. These have evolved since the mid-1980s, beginning as products for managing distributed mainframe and mid-range

computer systems, linked together over wide area networks. They manage the networking hardware - routers, bridges and multiplexers.

They also monitor the network traffic and alert the IT staff before a route becomes overloaded so they have time to take action. For example, if a network is running at 50 per cent capacity, but previously it was at 20 per cent rising to 30 per cent, then it is clear that the steady increase in traffic could pose a problem. The software should automatically sort out such problems.

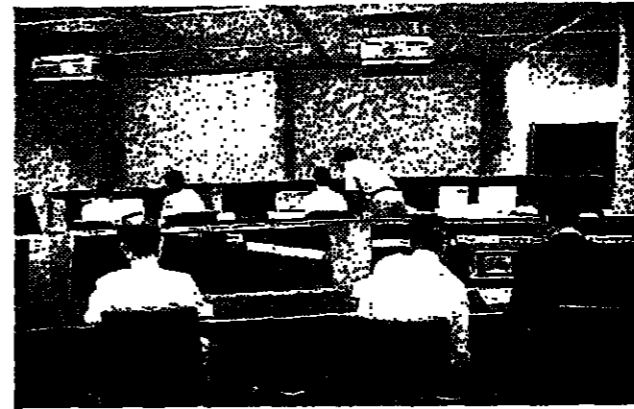
All three packages support the international standard for network management, known as SNMP (simple network management protocol). However, they can be expensive, especially for small networks. Logical Networks quotes a minimum of \$5,000 for Sun Net Manager, and \$12,000-£20,000 for Open View.

Much less expensive are the desktop management products, such as the Norton

Administrator from Symantec at £350 for a five-user pack, rising to £2,900 for 50 users. Lan Desk Manager, from Intel, costs £715 for a network with just one server up to £7,000 for one with 20 servers.

The Norton Administrator, for example, maintains an inventory of all PCs on the network, including the processor power and memory of each machine. Software upgrades and back-ups are also made easier, because the Administrator can distribute software throughout the network.

This solves a big network administration problem. Back-ups and other "housekeeping" activities used to be done by a centralised IT department. With the advent of PC networks, users were expected to do their own. But in practice, few do so. Instead, IT staff spend most of their time mov-



The Frankfurt network operations centre of Eusnetcom

ing around the organisation, often troubleshooting problems that occur precisely because housekeeping is done badly or not at all.

According to a recent study by Gartner Group, the market researchers, this type of administrative activity can represent up to 84 per cent of the total cost of ownership of a PC network. The initial capital investment comprises the remaining 16 per cent.

The Administrator also

deals with a relatively new problem facing businesses: that of software piracy. A business can face litigation if found to be using illegal copies of applications software packages. According to Mr Taylor, it is easy to copy software, or to load up a package on to several different machines. "I don't believe there are many companies in the UK which know how many copies of Microsoft Word they have," he says.

The software industry is moving to crack down on such illegal copying. The Federation Against Software Theft, an industry body set up specifically to deal with the problem, has the power to demand a software audit. "It is easier for companies to do an audit if they have the management software in place," says Mr Botterill.

The Administrator, for example, checks every software application on the hard drives, and monitors the usage of each. It tracks software licences, and can be made to enforce licensing - for example, if 500 licences are paid for, it can be asked to refuse to log on the 501st user who tries to access that particular package.

But all of the desktop management products are proprietary and one package will not work with another. A new technical standard, known as the desktop management interface has been agreed. Most manufacturers are now redeveloping their software to meet this standard, and products should be available next year.

Paul Taylor looks at the rapid growth of the portable computer

## Tumbling prices ignite market

Lightweight "notebook" personal computers and modem communications devices have made portable computing a reality for a growing number of mobile professionals in the past five years.

Advances in semiconductor technology and the miniaturisation of other components such as hard disc storage devices have enabled PC manufacturers to pack most of the functions of a desktop PC into an A4-sized notebook package weighing about 6lb and priced at £1,500 or less.

Colour notebook PCs using "dual scan" technology have become more affordable and easier to use. Most machines are now powered by fast Intel 486 processors, have large 200Mb or bigger hard discs and credit-card sized PCMCIA expansion slots for peripherals such as fax-modems.

Battery life has been extended through the use of low-power chips, power-saving features and improved battery technology. For example, Dell Computer's new Latitude range includes a dual Nickel Metal Hydride (NiMH) battery option which extends battery life to a maximum 17.5 hours.

Other manufacturers have developed machines for niche applications. For example, Toshiba offers a model that includes a CD-ROM drive, stereo speakers, detachable keyboard and facilities to make multimedia presentations while travelling and Cannon has machines which incorporate a bubble jet printer for those who require paper printouts but do not want to carry a separate printer.

Fujitsu is one of several manufacturers which have launched lightweight "tablet" PCs where data is input on to a flat screen using an electronic pen pointing device instead of a keyboard. Fujitsu's Stylisic 500, launched earlier this month, weighs 2.6lb and is designed to appeal to markets such as insurance, transportation, utilities, consumer packaged goods, pharmaceuticals and health care.

For engineers and others requiring the power of a workstation while away from the office, Tadpole Technology has developed a range of high-performance SPARCbook 3 laptop-size portables. Target applications and markets include computer-aided design, financial services, geographic information systems, equipment test and maintenance and telecommunications.

Other machines have a modular design, enabling screens and hard discs to be swapped

easily and some, such as AST's range of Ascendia 900, can be easily hooked up to larger screens or office local area networks using a docking station or port replicators.

Technical improvements, together with tumbling prices, have turned portable computers into the fastest-growing segment of the world computer market. According to Dataquest, the market research organisation, portable computer sales - mostly of notebook or even smaller sub-notebook machines - were worth \$3.6bn last year.

In volume terms notebook computer sales in Europe grew by more than 18 per cent to 1.33m with four vendors - Compaq, Toshiba, IBM and Apple - accounting for 59.5 per

cent of the market. However, portable computer sales still represented only 17.4 per cent of the total European PC market.

"Although portable computing represents only a minority of the total PC market, more and more people are adopting it in one form or another, particularly in a business environment," says Jeffrey Goldberg, a Dataquest consultant. "The notebook computer has replaced the secretary as the ubiquitous travelling companion."

Growth of the portable PC market has flattened since the boom years of 1990 to 1992. Nevertheless, Dataquest predicts that between 1993 and 1998 portable computer sales will grow by a compound annual rate of 23.4 per cent, compared with 8.4 per cent for desktop PCs.

Worldwide sales of mobile computing equipment, peripherals and services are expected to grow to almost \$45bn by 1997 according to California-based Market Intelligence Research.

Business use of portable computers is undoubtedly increasing. When Dataquest asked corporate computer purchasing managers across Europe whether any of their employees used portable PCs, 70 per cent replied "yes", with the UK and Germany showing the highest uptake. The three largest groups of users were top executives and finance staff, sales and marketing and engineering and maintenance.

More than 32 per cent also claimed at least some of their employees used portable PCs. Modems come in a number of shapes and sizes and are getting faster, smarter and cheaper. Some, usually based on proprietary designs, fit inside the machine but external modems - including some which fit into PCMCIA card slots - usually offer faster transmission speeds together with sophisticated data compression and error correction features. Most also provide the facility to send and receive faxes direct from the screen.

Currently most portable modems, including PCMCIA card modems, are designed to be plugged into a wall telephone socket. However, wireless modems have begun to appear which work either with existing analogue cellular mobile telephone services or with the new breed of dedicated digital mobile packet-switched data networks such as the Ram Mobile Data net-

work in the UK.

These modems represent the ultimate in portability since they allow mobile computer users to transmit or receive data and faxes from virtually anywhere. Eventually, however, there may be no need for modems at all since, at least in theory, it should be possible to plug a digital device, including portable computers, directly into the next generation of mobile telephones operating on digital cellular networks such as the GSM networks in Europe.

Eventually, the continued convergence of telephone and computer technologies is expected to lead to multi-purpose handheld digital devices which will combine the functions of data processing and voice and data telecommunications.

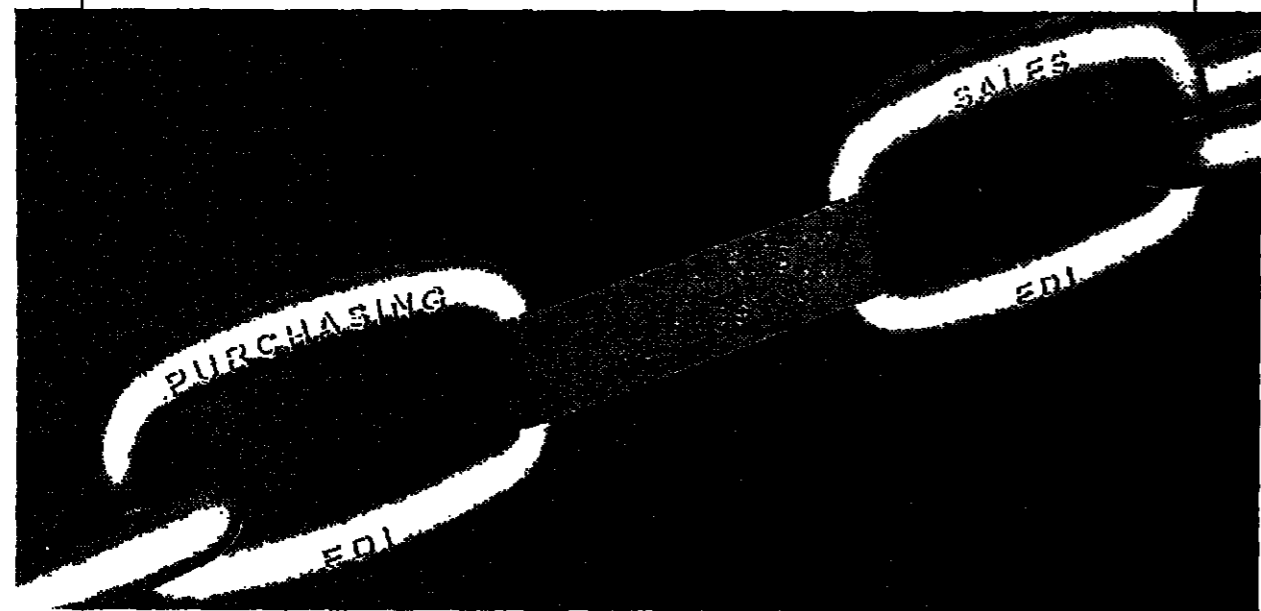
Sales of the first generation of so-called personal digital assistants, such as Apple's Newton, did not live up to expectations, largely because they lacked sophisticated wireless telecommunications facilities.

According to Dataquest, the European market for handheld computers, including pen-based machines, actually declined from an estimated 401,000 units in 1992 to 283,000 last year.

"For the future we predict that familiar keyboard-driven handhelds will comfortably outsell pen handhelds, but these will most likely be hybrid machines using a pen for drawing and pointing, and the keyboard for text entry," says Mr Goldberg.

Dataquest argues that wider acceptance of handheld PCs is highly dependent on the availability of ubiquitous and cheap connectivity, in particular wireless networking, and on a rationalisation of the many competing platforms.

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## TECHNOLOGY IN THE OFFICE 3

Sheila Jones looks at the fast growing market for electronic data storage

## Systems fuel demand for space

**D**ocuments can be stored in a heap on the desk, in a filing cabinet or in a buff folder, but they can get buried or go missing. It takes time to retrieve data from cabinets and they take up space.

A square inch of magnetic disk space can accommodate as much information as 20 filing cabinets or more. But despite a rise in the use of electronic storage methods, less than 5 per cent of the world's business information is stored "on line" in a computer. "The rest is on microfilm, microfiche and plain old paper," says Paul Wollstaetter, research analyst with the US Gartner group.

The demand for electronic storage is growing rapidly - at a rate of 40-50 per cent a year and this is expected to continue. The UK data storage market alone is likely to be worth more than \$400m this year, rising to about \$700m by 1997, according to Dataquest, the research group. Demand is being fuelled by the greater use of computer-based office systems, the onset of multimedia applications, networks linking computers to telephone lines and an increasing use of software programs that eat up storage space.

"Only a few years ago, a 20 megabyte hard disk would have been enough for most people's needs," says Trevor Duplock of Micropolis, the US disk drive manufacturer. "Today, with the availability of software such as Windows NT which requires 100Mb of disk space, the typical user needs much more space."

The market's voracious appetite is forcing average disk and disk drive capacities ever upwards. According to a recent study by Disk Trend Report, the US analyst, demand for 100-300 megabyte disk drives, which led the market in 1993, will plummet by 50 per cent this year in favour of 200-300m megabyte drives.

By 1995, 300-500Mb drives will lead the market. The study expects growth in sales of hard disk drives for personal computers, workstations and network file servers to boost global revenues to about \$38bn by

1997. Manufacturers, meanwhile, are responding by providing smaller disks with ever-increasing capacities.

But as demand rises, the price per megabyte of storage is expected to continue to fall and storage options to increase.

The way an organisation chooses to store data depends on four main factors. How much information needs to be stored; how quickly access is needed; whether the data needs to be processed; and the cost per byte of information.

There are two main options. Magnetic disks dominate the storage market because they are rewritable, while optical disks are usually not. Magneto-optical disks, which form only a tiny portion of the market, are rewritable, but the cost of equipment is relatively high and retrieval times are slow - the cost per megabyte, however, is low.

Most PCs are fitted with rewritable magnetic hard disks as well as floppy disk drives for portable data storage. A high proportion of new PCs are also now equipped with a CD-Rom (read only memory) drive for multimedia applications. The CD-Rom has become a popular medium for software distribution because it is relatively cheap, easy to handle, and capable of storing large amounts of data, voice and images.

A new generation of storage devices that adhere to PCMCIA (Personal Computer Memory Card International Association) standards is also beginning to take hold. These devices, often called memory cards because they are not much bigger than a credit card, incorporate semiconductor memory chips and provide data storage capacity approaching

that of a magnetic hard disk.

Prices of PCMCIA cards are coming down as the cards become more popular and manufacturing volumes increase. The advantage of memory cards is that they are rugged, light weight and portable. This makes them particularly well suited to notebook PCs and hand-held computing devices.

In the mainframe and mid-range computer arena, another acronym that is becoming better-known in the market is RAID - redundant array of inexpensive disks. Standard, smaller disk drives are stacked together to give the sort of storage capacity offered by a single, more expensive drive.

Linked in an array, they take large amounts of data and access times are relatively swift. Manufacturers, among them EMC, StorageTek, IBM and Micropolis, say

they offer greater security because the failure of one, large disk means much more is lost than if one smaller disk in an array fails.

At the same time, as manufacturers are fitting more data on to smaller disks, their price is falling, making it cheaper to make back-ups to store precious data on disks off site. "The risk for the user is in a single, expensive disk. If I can buy two small disks with the same dollar and each with the same capacity, then I buy the two and use one to copy and store it," says Mr Wollstaetter.

For now, magnetic hard disks will continue to dominate, says Mr Wollstaetter. "Magnetic disks have almost pushed optical disks out of the picture." But he believes the medium of the future will be holographic crystal.

Scientists at Stanford University have recently developed a fully automated digital holographic data storage system with a data capacity of 163,000 bytes. "By the turn of the decade we will have holographic recording and we'll be looking at capacities of one terabyte (1,000 gigabytes) in a cubic centimetre."

\* *Rigid Disk Drives, 1994, Disk/Trend Report, US. Tel: 415 959 2590.*

Control of office software needs to be returned to computing professionals, says John Kavanagh

## Lack of discipline a potential disaster

**S**taff at entertainment group Polygram International must either use Wordperfect and Lotus 1-2-3 or be denied access to company networks and even face a reprimand.

This is the company's way of dealing with an issue which is increasingly gaining attention as organisations seek to adjust the balance between end-user software freedom and the central control of standards, contracts, support and costs.

Office computing is now "generally out of control", says Robin Bloor, head of the research firm Butlerbloor, who has just produced a report on corporate strategy for office systems. He identifies some reasons.

First, traditional computing departments do not understand office computing and are not used to supporting distributed systems. Meanwhile, business departments often include PC enthusiasts who think they know more than they do and interfere with attempts to introduce controls.

As business users gain budgetary and operational independence from the computing department, control of computing resources becomes a political issue.

A new type of conflict is therefore emerging between computing departments and their end-users. In the past, business people complained that requests for new software took months to be dealt with.

PCs running spreadsheet software gave them a taste of freedom but the falling cost of software packages and growing familiarity with PCs mean they are now moving on to buying and illegally copying software products which are not supported or approved of by the central computing unit.

"In some offices we have seen a lack of discipline which almost beggars belief," Mr Bloor says. "The horror stories include no back-up, virus infections, the spread of illicitly copied games, a complete lack of training, undeclared and

the software piracy is by end-users who do not realise they are doing anything wrong.

Other research suggests that lack of training means that only 5 or 10 per cent of the facilities of office software products are exploited.

Studies of spreadsheet software users have shown that they are in fact programmers without programming training: one survey by accountancy and consultancy firm Coopers & Lybrand found that 90 per cent of spreadsheets had errors of more than 5 per cent in their results.

**'A major problem is that few organisations have defined sensible boundaries and responsibilities,' Mr Bloor says**

unaudited software development, not to mention the purchase of non-standard hardware and software."

Such findings support claims by the Federation Against Software Theft that half the office software used in the UK is illegally copied. This costs jobs in the software industry and stifles innovation by cutting development budgets, the federation says. More than half

Action is needed because, as Mr Bloor puts it, "the end-user is truly in the ascendancy". The office PC is now used for most writing and calculating; soon it will be the standard for all data storage and communication too, he says.

Growth of workgroup computing and of client-server systems is also complicating both local office systems and corporate applications which

combine local and central processing and data storage.

"A major problem is that few organisations have defined sensible boundaries and responsibilities," Mr Bloor says. "It requires senior management intervention to exert control where it has been lost; it also requires the formulation of appropriate corporate standards for both user departments and computing departments to apply."

He believes the computing department must concede control and ownership of office systems to the users. "What is needed is a partnership between users and the computing department which allows users' enthusiasm and energy to be capitalised on and properly channelled."

This partnership must give software purchasing back to the centre, Mr Bloor says. This will not only produce the biggest discounts but also ensure that there are corporate standards, bringing savings in support and training.

The computing specialists must be allowed to instil the discipline of software and data back-up and security in end-users and hammer home the



Bloor: office computing is now "generally out of control"

importance of avoiding software piracy.

If users are allowed to develop their own software, using spreadsheets or the increasing number of apparently (but not really) simple development products appearing on the market, the computing department must be allowed the final say on testing and quality.

Such proposals highlight the changing nature of the computing department and the need to rethink software support, according to Philip Virgo, head of IT Strategy Services,

	1988	1994	% change
In IT departments			
Managers	48,000	47,000	-4
Systems analysts	30,000	35,000	17
Analyst-programmers	48,000	54,000	13
Programmers	43,000	20,000	-54
Systems programmers	19,000	18,000	-5
Network staff	11,000	10,000	-9
Operators	90,000	41,000	-54
User support	n/a	20,000	>200
Sub-total	290,000	245,000	-16
Outside IT depts			
User support	n/a	50,000	>200

Source: IT Strategy Services research and estimates

who produces an annual study of skills trends. He says companies need to review their computing department structures and recruitment policies in the light of the "fundamental change" in the nature of the computing community.

Growth in the use of office software means that a new computing staff category - that of user support - has appeared from nowhere in the past five years.

He believes most growth in employment in computing will be in user support - and that office software users them-

selves could fill these jobs.

Mr Virgo says recruitment traditionally involved taking on graduates as technicians and promoting them to systems analysts. But today's need is especially for business analysts and user support people.

"Secretarial and admin staff are now often in charge of routine computing in user departments," Mr Virgo says.

"Where computing is critical, the staff increasingly report to a user manager with solid computing experience, typically gained from a posting to the

computer department for a systems project."

He argues that such trends mean the demand for computing skills, especially in user support, could be met increasingly by retraining users.

Mr Bloor agrees that office staff are becoming their own software support specialists: he says more than 80 per cent of end-user support is done "unofficially" by end-users who are supposed to be doing other jobs.

"This work is not budgeted for. As a result, the cost of providing support is out of control in many large companies".

Mr Bloor, however, tends to feel that support should be the responsibility of central computing professionals rather than retrained secretaries.

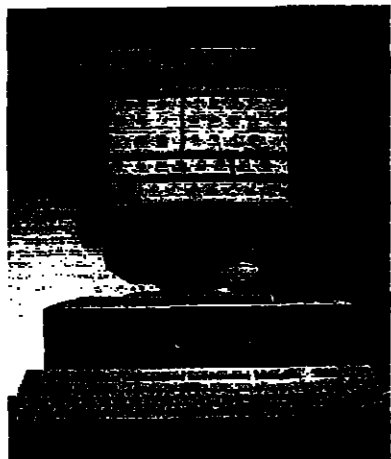
Whatever the finer points here, companies must either promote the partnerships between user and computing departments that Mr Bloor talks about or sooner or later face the "horror stories" he uncovered. For people will increasingly use information technology to develop their own working environments, drawing together different pieces of software.

"Ultimately, end-users will all become developers of a kind," he says. "The trouble is, the typical end-user is blissfully unaware of sensible computing disciplines."

\* *The Butlerbloor report, Corporate Strategy: the Desktop, is available on 0908 373311.*

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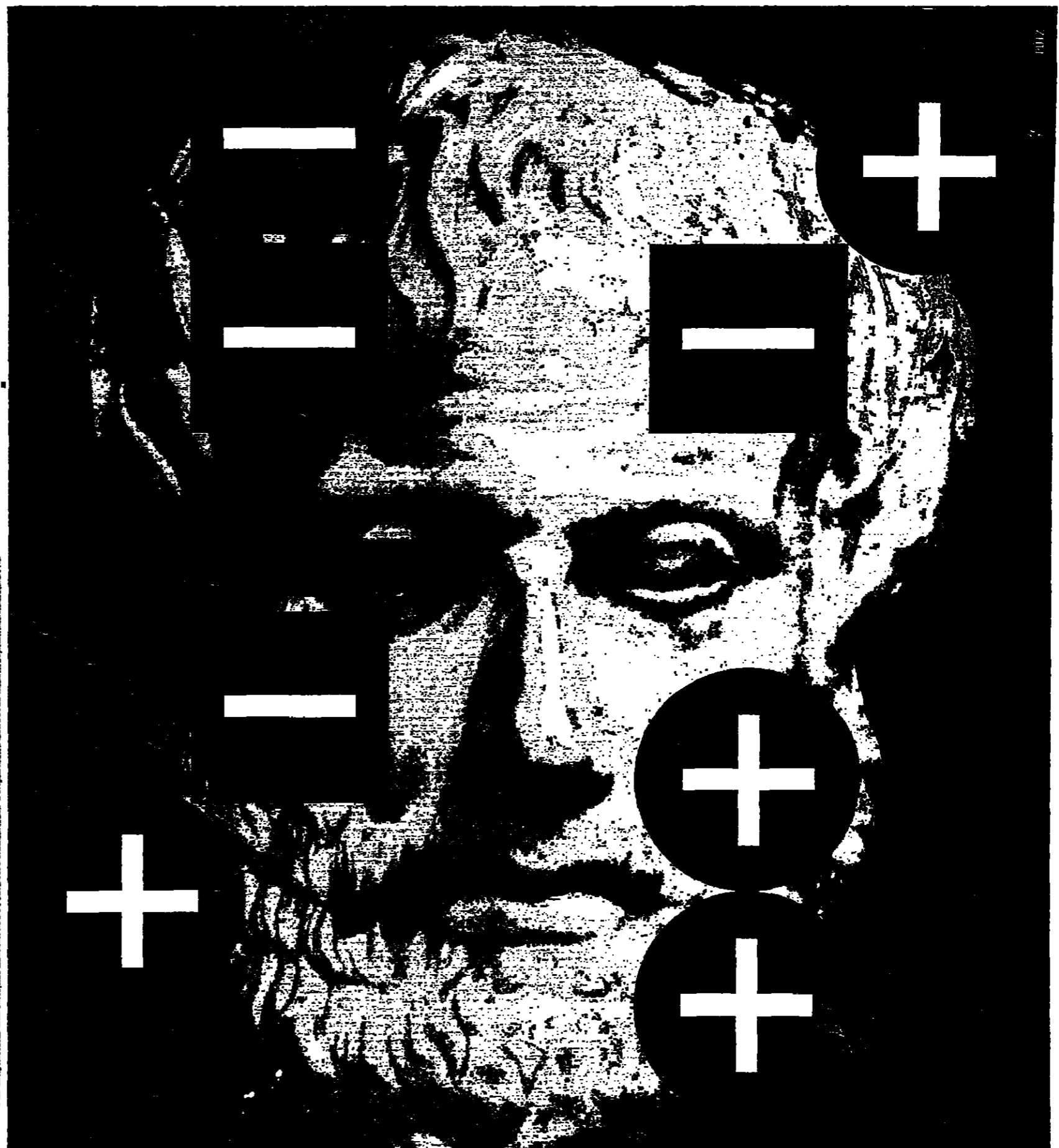
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The paperless office has been an enticing image since the invention of word processing a few decades ago. The promise was that it would improve efficiency and profitability by doing away with document duplication, lost invoices and desktop paper mountains.

But most of business information is still on paper.

"At least 80 per cent of information is in paper form and that's not going to change in a hurry," says Andrea Wharton, research director of Wharton Information Systems in the UK. "Computers might communicate with each other, the bits are communicating on the internet, but for the majority of us, we'll still be using paper for at least another five years."

The human attachment to paper is only partly to blame. For many small companies, it may not yet be worth the relatively high cost of investment in document imaging systems, and for larger organisations, the move from paper is still a "big conceptual leap," says Ms Wharton.

But the move away from paper has started and it is speeding up. The financial services sector continues to be the biggest user of document management systems, followed by the oil and chemicals sector and government bodies. Electronic document processing and management is one of the fastest-growing sectors in office automation.

In its latest survey of buying intentions\*, International Data Corporation, the US information technology analyst, predicts that more than a third of companies and organisations will buy document management systems this year.

The survey, of 300 US-based companies and organisations, indicates that government bodies are catching up with the financial sector as the biggest buyers. And while companies are becoming more demanding as the industry matures, more than 60 per cent of current users say that logging paper in and out of their document management systems is already saving them time. In a UK survey\*\* by Wharton infor-

Document management lacks an umbrella system, says Sheila Jones

## Looking for a super glue

mation Systems, more than two-thirds of current users said they planned more spending in the coming year.

But while there is a wide choice of software for specific applications, such as accounting and loans procedures, the big gap in the market, according to the Wharton report, is in comprehensive systems that can be used across organisations regardless of the type of information or where it is stored.

"At the heart of future systems there will have to be a product that can track and manage all the files in an organisation, no matter where they reside and no matter what data type they are - voice messages, images, text files, data files." In addition, users will need the "most flexible type of retrieval possible". At the moment, organisations are "using bits of the ultimate solution, usually the bits that they perceive as having the most immediate impact on their organisation".

The report predicts that by the middle of this decade, the point will have been reached where the disparate elements of document management will have to be brought together in an umbrella system. "It is unlikely that any single organisation will be able to provide that umbrella system plus all of the elements that operate underneath it. If modern networked systems such as Novell Netware can be viewed as a sort of organisational glue... then what we are looking for in document management terms is a super glue."

Organisations currently moving towards providing such a glue include Interleaf, Saros, Soft Solutions and Excalibur, whose pattern recognition technology is already being used by other vendors as

a building block into their own systems.

Both the Wharton and IDC studies point to trends already under way that could lead towards a unified solution, helping buyers to find products that will easily integrate with their existing systems and that will look after all their processing needs. IDC says alliances are being formed that will create standards to make document management possible across disparate systems.

"The first of these efforts is the Shamrock consortium, initiated by Saros and IBM, and joined by document managers, user corporations and infrastructure vendors such as Microsoft, Interleaf, Hewlett-Packard, Adobe and Frame." The Wharton report, however, cautions that Shamrock, while seeking an umbrella system, also intends to preclude development of incompatible and counter-productive systems.

"While we... applaud any action that helps to set standards... we are rather more concerned about the idea of working to 'preclude incompatible and counter-productive' standards," says the report. "Who is to be the arbiter? Such statements, it adds 'are more than a little worrying, especially when such large organisations... as IBM, Hewlett-Packard and Microsoft are members of the coalition'." The Shamrock alliance has promised to produce integrated architecture that will bring together enterprise library services, document communication and generation with business process applications. A first version of the full system is due to be unveiled early next year.

In the meantime, choosing a document management system continues to be difficult, especially for smaller companies that cannot afford to employ specialists. Even for large

organisations, the choice can be hit and miss, particularly at a point in the industry's development when the central component for successful document management may be still missing.

In the UK, according to the Wharton report, Keyfile led the market last year among suppliers of software packages, most of which are Dos-based.

Canofile still dominates in turnkey systems costing less than £50,000, according to Wharton, which identifies no clear leader among vendors of client/server systems costing more than £50,000, with the market shared by Filenet, Olivetti, Wang, ICL and Trimco. Climage, Intergraph and Trimco, lead in large format

systems, which the industry is targeting the oil and utilities markets.

Advice on buying new systems can be sought from industry bodies, such as the UK Association of Information and Image Management (UK Aim). There are also specialist books on the market such as the Document Management Yearbook, along with a raft of specialist magazines.

\* The 1994 Document Management User Awareness and Buying Intention Survey, & Document Management Market Review, International Data Corporation, US. Tel: 508 873 8200. \*\* Document Management - the Next Steps. Wharton Information Systems (sponsored by UK Aim). Tel: 81 891 6197.



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<sup>1</sup> UNIX is a registered trademark of UNIX Systems Laboratories Inc. in the USA and other countries. <sup>2</sup> Aberdeen Group, Market Viewpoint, 4 Feb. 1994.

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Manufacturers have added a number of new features to photocopiers, says Julie Harnett

## Nearing a digital era

Long past its forecast sell by date, the analogue photocopier market is alive and well and still growing, albeit at a more modest rate than in previous years.

According to Jacqueline Hendriks, document management industry analyst at Dataquest, the market increased by about 7 per cent in 1993, with 1.15m photocopiers shipped in western Europe and the UK accounting for 135,400 unit placements.

However, while manufacturers are still investing heavily in the technology, with the main R&D focus being on higher reliability and productivity with greater ease of use, the industry is working steadily, if quietly and cautiously, towards the digital era.

Oce van der Grinten, Europe's one remaining indigenous copier manufacturer acclaimed for its "clean and green" high volume analogue machines, has indicated that 1996 will mark the end of the line for further development of analogue machines, with all R&D investment from then being devoted to digital technology.

It is not as bold a step as it may sound. As part of a European office automation initiative in the 1980s, Oce hosted the first ever demonstration of digital copier-printer technology with connectivity support across multiple computer platforms.

But the investment required to turn it into a commercial product line was not sustainable, so the developments were put on the back burner to



Infotech's new 9385 is its fastest copier to date

await a more digitally aware marketplace.

Developments across the copier industry over the past few years should make the copier-based printer (as distinct from the printer that has a multiple copy function) the preferred choice for organisations looking for a direct connected output device that can produce multiple documents sets, in colour or black and white, finished ready for distribution.

State-of-the-art attributes that should appeal to the computer print world include:

- Multiple copy speeds of up to 100 pages per minute
- 100 per cent operation at full rated engine speed for

every process, including double-sided copying, from image input to sorting and stapling;

- Robust paper feeding systems that minimise the risk of paper jams;
- Longer lasting components that are more environmentally friendly; and
- Graphical displays with touch-screen controls.

Epitomising the latest trends, the Minolta CS Pro (Customer Satisfaction Productivity) Series is claimed to be 250 per cent more reliable than existing machines, with a CPU Watchdog facility which monitors each operation (feeding, duplex, sorting, stapling).

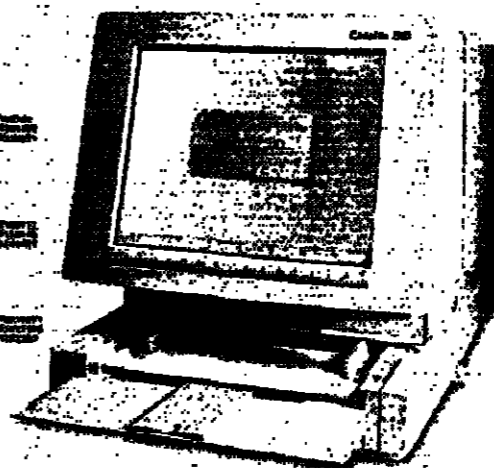
Continued on page 6

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## TECHNOLOGY IN THE OFFICE 6

A few seconds makes all the difference, says Monica Horten

## Faster fax transmission helps cut the telephone bill

One might wonder why it matters if a fax machine transmits a page of text in two seconds instead of 11. After all, the seven seconds makes little difference to most people.

But fax machine vendors believe that speed is important, even if most of their customers do not realise it. Super-fast fax machines, transmitting a page of A4 in just that amount of time are expected next year from manufacturers such as NEC.

With prices predicted to be about £3,000, they will be competitive against today's heavy-duty, top-of-the-range machines.

The real benefit lies in the potential for savings on telecommunications costs. The two-second transmission time means that three to five pages can be transmitted in the same time as one today. Most installed fax machines transmit at 9.6 kilobits per second, averaging 9-11 seconds per page. The fastest machines transmit at 14.4 kilobits per second, which average six seconds per page.

Businesses which regularly use fax for long documents such as contracts, will notice a large reduction in the overall transmission times. If they are paying high international call charges, that reduction should translate into a lower telephone bill.

The new machines will conform to the Group 3 technical standard for fax - the most common type of fax machine used by businesses today. They will operate over ISDN lines at 64 kilobits per second. Similar transmission times are already possible on digital fax machines - available from manufacturers such as Canon and Ricoh. Digital fax, also known as Group 4 fax, has been available for several years.

But it has not proved popular, with less than 1,000 sales a year throughout Europe, according to figures from the industry consultancy BIS Strategic Decisions.

The reason is not that users

doubt the benefit of the higher speed. It has more to do with technical standards. Group 4 is incompatible with the analogue Group 3 faxes. This means that it can only transmit to another Group 4 machine.

Usually, Group 4 machines are sold in pairs, for a specific purpose. For example, a law firm with offices in the US and UK.

Ricoh's Chris Wills says the cost can be justified by comparing the cost of a 1.5-second transmission time with the Group 3 average of 11-15 seconds at international call rates.

"You can work out a payback in months rather than years," Mr Wills explains. But BIS consultant Bruce Clements, believes the super-fast Group 3 machines will be a better option than Group 4 because they can talk to any Group 3 fax - they adjust the transmission speed where there is a slower fax at the other end.

He points out that 1.9m fax machines were sold in western Europe in 1993. "It is a question of the installed base. The whole point of fax is that you can talk to someone else," said Mr Clements.

But speed is not the only area of change for fax technology. Next year's fax machines will look different, and in many cases will do much more than faxing. Ricoh's IFS 66, which is now under development, will incorporate PC-fax and electronic mail facilities. It will also function as a printer and a document scanner.

The new "intelligent fax" will allow people to receive faxed information, add to it and then send it on to someone else as electronic mail. It will also hold individual phone books for people, which will be able to store regular fax destinations.

Programming numbers into

the machine will be made easier using the new touch screen controls - a graphic user interface with computer-style screen icons. To send to regular destinations, people will access their phone book, highlight the number and send.

The product derives from a development led by software company Microsoft. Called Microsoft At Work, it aims to produce a common means for connecting disparate pieces of office equipment, including printers, scanners and copiers, as well as fax machines.

Today, all products are proprietary and linking them together is difficult. Other fax manufacturers working with Microsoft include NEC, Canon, and Oki.

The At Work interface will mean that fax machines can be attached to local area networks, and use them to control incoming and outgoing communications. It should also be possible to use fax machines as linking equipment between two different local area networks such as Banyan Vines and Novell Netware. At Work products will become an alternative to the PC-fax and Lan-fax packages currently available, such as Delrina Winfax and Gamma Fax.

Some industry observers question the need for At Work when these other products already exist. But At Work proponents claim that many businesses are familiar with fax, but have difficulty understanding computer communications. Providing them with a means of linking the fax machine to a computer network, is a more acceptable solution, they say.

Paul Gibson, sales director at Oki Systems said "technology" stops many businesses from buying PC-fax products. The At Work products provide "the best of both worlds. And

you don't need to know how it works", he said.

Oki has a forerunner product to the At Work concept, which integrates fax with a printing and copying functions under the control of a PC, for just below £3,000.

Ricoh's Chris Jobling points out that the At Work concept more closely integrates the computer system with the fax, than the traditional PC-fax products. The At Work concept incorporates the standard fax, with the PC-fax, the Email, the printer and the scanner, he says. To get the same functionality without it, would mean exiting one application and going into another. The operation would not be as smooth.

NEC's forthcoming Nefax-MFD, also based on the At Work interface, will enable the fax machine to be used as an optical filing system, by attaching an optical disk drive.

It will also have extra security via an electronic signature. The signature effectively seals a document so that it cannot be tampered with. It can also be used to generate an audit trail, showing where the fax has been and who has looked at it.

The At Work project is also expected to design a standard screen interface for faxes and other equipment. Screen-based fax controls should mean that the machines are easier to use than today's unfriendly machines which provide no guidance.

However, industry observers warn that At Work concept has yet to be proven. "Just because you develop something, doesn't mean that it will be taken up," said Lester Davis, of the British Facsimile Industry Consultative Committee.

There is further concern that the development is being led by a single software vendor. The fax industry traditionally has developed technical standards by consultation, and by mutual agreement on a common approach.

The potential revenues appeal to Amstrad. Just three years after saying that there was no money in computer peripherals and the only thing to do with existing stocks was to "throw them in the River Thames", Amstrad boss Alan

Printer sales show a continued appetite for paper, says Julie Hamett

## Documents not yet dead

Paper prices may be rising, business, but our appetite for documentation is apparently insatiable. Multimedia communications and electronic data storage may be growth markets, but the paperless office is clearly as far away as ever.

Almost 9m printers were sold in Europe in 1993, an increase of 8 per cent on the year, according to Matthew Checkley, printer market analyst at market research company BIS Strategic Decisions. Some 4m of those units were inkjet printers (most designed for personal use), 1.5m more than in 1992.

The survival of a mass dot matrix market appears doomed. Just under 3m dot matrix printers were shipped in 1993, 1.3m fewer than in 1992. Indeed, Mr Checkley forecasts that by 1998, the dot matrix market will be reduced to a niche sector with just 5 per cent of total printer sales - for applications such as high volume multi-part stationery.

But while the Star Micronics factory in Wrexham has collapsed under the strain, other dot matrix suppliers are optimistic.

Rod Saar, managing director at Mannesmann Tally believes dot matrix will still represent 20 per cent of the total printer market by 1998.

Eddie Huggins, director of marketing at Citizen, agrees, claiming sales of the ABC Colour dot matrix printer, at 30 per cent above market expectations, proves that it is still a viable technology in the SoHo (small office/home office) market where an occasional colour capability at low cost is a bonus.

However, inkjet is clearly the technology for the masses. According to Romtec, the total UK printer market in 1993 was worth £740m of which inkjet printers commanded a 25.6 per cent share by value, 38 per cent by units. Of that market, Canon claimed a 41 per cent share in value, 52 per cent by units.

All four manufacturers of core inkjet technology (Canon, Epson, Hewlett Packard and, more recently, Olivetti), hope to benefit from the trend towards colour capable inkjet printing, with Mr Checkley of BIS projecting sales of 6m such units by 1998.

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date is the Lexmark WinWriter 600 (DPI) launched earlier this year. With no competitors to help drive the market, it could be something of a hollow victory, although 1995 might change all that.

Development activity in the networked printer market is just as heady, and no wonder.

NEC was the first to introduce a GDI printer and it now hopes to set the printer world alight with the second generation series of SuperScript printers bringing GDI advantages to network applications. NEC is not alone, with others, including Brother, hard on its heels.

The frenetic activity in the low end personal printer market could affect the positions of the market leaders. For now though, according to BIS Strategic Decisions, Hewlett Packard continues to dominate this sector with a 51 per cent share (up from 39 per cent in 1992), its nearest rival being Oki with 7 per cent (up from 6 per cent in 1992).

A long-promised Microsoft At Work concept, it is said, will provide users with a common graphical interface for click-on access to any function including copying and fax.

Although there are about 75 companies involved, the only evidence of developments to

More than 1m laser/LED printers were sold in 1993 and volumes are expected to increase significantly

Sugar announced a collaborative agreement with Jarfalla ICC, ABB, a manufacturer part owned by IBM, to produce a "a landmark" product in compact, low cost, high quality inkjet printer technology.

Both Mr Checkley of BIS and Graham Salmon of Printer Europe, Dataquest point to the rise in the sales of laser/LED printer as an indication that the days of mono (black only) inkjet are numbered.

More than 1m laser/LED printers were sold during 1993 and volumes are expected to increase significantly over the next year or two with the advent of Windows GDI (Graphical Device Interface) laser printers, such as the



Xerox 4850 highlight colour copier. Rank Xerox predicts sales 50 per cent ahead of target by the year's end



Mannesmann Tally T-Win.

The advantages of GDI technology are that it is easier to use, has faster PC-to-print processing speeds and truer WYSIWYP (What you See is What you Print). It also avoids the need for a complex built-in printer control language and a control panel; hence the low prices.

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Development activity in the networked printer market is just as heady, and no wonder.

Industry analysts point to the advantageous features of developments such as IBM's strategic architecture

According to Dataquest, by 1997 more than 70 per cent of European PCs will be connected to LANS, resulting in a tripling of network printers within the next five years.

Canon, which has produced 10m laser beam print engines (70 per cent of the total) in the past 10 years, is targeting small groups with the LPB-4, a 4 ppm Windows printer priced at the same level as a high specification inkjet. The price per user is almost at dot matrix levels.

As individuals increasingly run different applications simultaneously, network printers from suppliers such as Mannesmann Tally, Oki-Printing Systems and QMS have

ability to upgrade it to digital copier-printer at a later date to allow direct input from a personal computer.

The future of digital colour copying for general office applications is not quite so certain, however.

Buyers know that access to such a facility would enable them to produce more eye-catching presentations and improve their chances of winning new business, but the catalyst of change is usually cost savings.

Nevertheless, the 1994 Kodak Office Imaging survey found that more than a quarter of organisations in the UK use spot colour for 10-30 per cent of document colour compared with just 6 per cent a year ago. Moreover, 50 per cent of companies reported that 10 per cent of their total document output was colour compared with one in 10 companies in 1993.

Yet, according to Roger Riseley of InfoQuest, a new market research organisation, just 1,300 colour units were sold last year, with only the Canon CLC 10 selling in anything like "real numbers, though far less than in 1992". Partly responsible for the decline, he suggests, was the arrival of the Xerox Majestik which "was beginning to walk away with the colour market towards the end of 1993".

## New era for photocopiers

Continued from page 5

If a fault develops, the function concerned is isolated so that other copier functions can continue to be used as normal.

Higher productivity innovations include:

• More logical left to right feeding of originals and two-way remote diagnostics facility (Minolta);

• A zoom area indicator which tells the user which area of the original will be copied, plus a new print engine which only requires servicing once every 100,000 copies (Toshiba); and

• An AADF (inverting automatic document feeder) which automatically counts, feeds, copies and returns up to 50 originals in order (Panasonic).

Developments from Ricoh include an auto tandem paper tray with automatic switching for continuous operation; a dual feeder which allows one job to be started as another is being completed; a 360,000-copy organic drum; and auto sensing of operator presence which automatically activates the touch-screen LCD control panel.

At Sharp, the main focus is on high volume copying with an innovative vacuum paper feed system which lifts and

separates each sheet of copy paper for trouble-free operation; while at Konica a low-volume copier has a clam-shell design which opens from the back rather than the side to give service engineers easier access, plus cross-range compliance with the more stringent Blue Angel II environmental standards.

Most manufacturers with digital products in the wings, including Infotec, Konica, Lanier, Minolta and Ricoh, say that the bid for a share of the copier-printer market will begin in earnest in 1995. The only question is, how digital will be the products.

Clever tricks offering advanced image manipulation such as 999 per cent zoom reduction and enlargement may be a talking point, but they are hardly practical features likely to win over users on a general office computer network.

More useful is easy access to the document production facilities and transparent connectivity with good software.

"Digital copiers like the AR-5040 will challenge the way companies think about the role of the copier in the document production process," says David Naylor, general manager

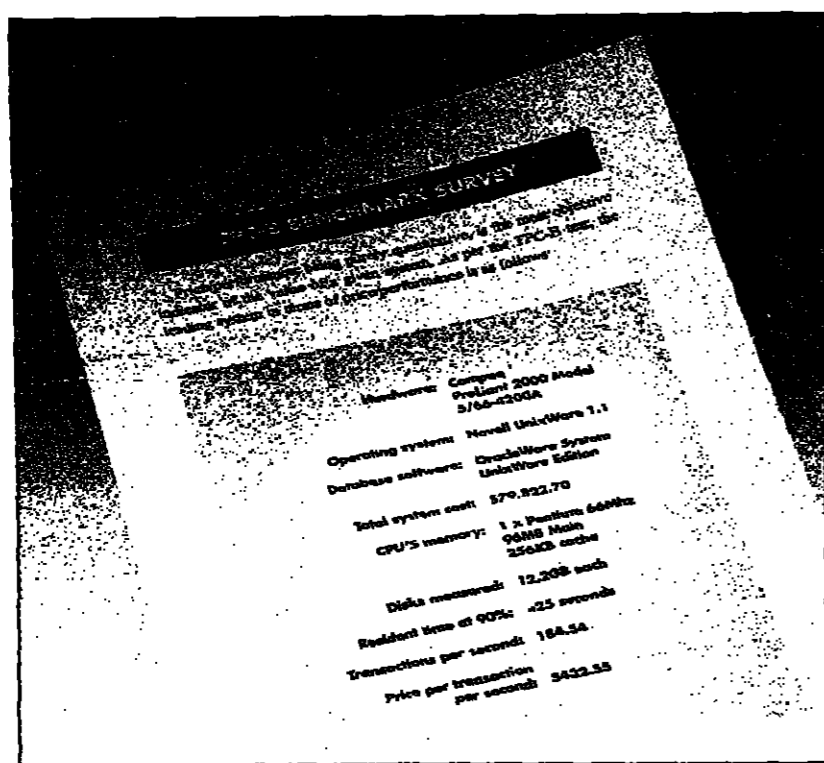
for copiers and fax at Sharp UK.

"Features such as duplex (double sided) scanning, mail-merge, anamorphic zoom and even booklet production, combined with a SCSI interface, will bring a new level of document finishing at the working group level previously only available on much larger, high volume copiers".

Industry analysts such as Jacqueline Hendricks of Dataquest point to the Canon GP55 which can now be delivered with a computer interface that turns it from an expensive copier into a high-speed (30 pages per minute) network laser printer/copier complete with A3, duplex, sorting and stapling capabilities.

Unlike commercial concerns, educational establishments have already embraced the concept of the digital copier-printer, in the form of the upgradeable electronic duplicator from suppliers such as Alcatel, Gestetner, Infotec, Ricoh and Riso.

Offering speeds up to 130 copies per minute, a high 400 DPI resolution and cost per copy of less than 1p in multi-copy mode, 40 per cent of purchasers say the cost-justification of paying a higher price for a copying facility was the



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If it were just fast, that would be one thing. But UnixWare also clearly demonstrated new highs in reliability and recoverability from system failure.

All this is hardly surprising, since UnixWare

is built on the latest version of UNIX System V Release 4.2, and was developed by the same professionals who created the original UNIX operating system. Furthermore, these same engineers also ensured that UnixWare is extremely versatile, supporting over 2,500 business critical applications.

We could go on listing the achievements and capabilities of UnixWare. In the end, though, there really is only one other list that the price-performance winner should be on. Your shortlist.

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NOVELL The Past, Present and Future of Network Computing

\*UnixWare test results from March 23, 1994 for a single processor (pentium) system (ProLinux) 2000 Model 5/60-2000. Running Oracle 6.1.7. System: UnixWare Edition. Results: 100% based on 104.24 (98). Other results detailed in TPC-B Benchmark Report. All company/product names are trademarks and/or registered trademarks of their respective companies.

Cutting cost calling

BOX OF FT SU

## Mobile phones

## Cutting the cost of calling

Hollywood would have us believe that mobile phones are the answer to life. In between the bullets, Keanu Reeves, hero of the high-adrenaline movie "Speed", spends hours on a mobile. In Harrison Ford's "Clear and Present Danger", mobile phones are used to run a covert mission. Reality soon parts from fantasy. Mr Reeves' mobile batteries never seem to wear out. And Harrison Ford is not seen paying any phone bills. But for the company whose phones aren't running on charisma, paying the bill is a costly business.

One way of keeping costs down when phoning the office rather is to link the office PABX (switchboard) directly to a mobile phone network.

Even if a company has only five heavy mobile phone users calling the office regularly, this approach can cut costs by up to 45 per cent, according to Mike Short, a spokesman for cellular network operator Cell-net.

To get these savings, a company must rent a telecoms line of up to 30km from Mercury or BT and sign up for Cellnet's Call Access service or Vodafone's Vodanet.

The leased line will link the PABX to a switching centre (or a radio base station), which is part of the mobile phone network. The centre will switch calls between the PABX and the cellular network.

Call Access and Vodanet can cut the cost of calls to and from the office because these calls don't have to travel through the BT or Mercury network.

Another advantage is that dialling and call set-up times are faster.

Vodafone spokesman Mike Caldwell says that when he wants to call another member of staff from his mobile, he simply dials a short code (91 in this case), followed by the colleague's extension number. The call does not have to be answered by the receptionist but goes straight to his colleague's desk.

Incoming calls to staff who are out of the office can also be handled more conveniently. If they cannot be dealt with by someone who is in the office, they can be transferred to the mobile user - without the caller having to dial another number.

Vodanet and Call Access can be used with either analogue (traditional) mobile services or the newer GSM (Global System for Mobile) services.

But whether a company wants to link its PABX to a mobile phone network, or simply use mobiles by themselves, it is better to opt for phones based on digital technology, such as GSM or PCN (Personal Communications Network) - a variant on GSM.

This is because digital technology has a number of advantages over analogue technology.

● Clearer conversations. Digital technology cuts out background noise on mobile phones just as it does on compact discs.

● Greater security. Digital signals are encrypted electronically before they are sent and this makes eavesdropping more difficult.

● Faster connection. Once the number has been dialed on a digital phone, the call will be connected immediately. On an analogue phone call set-up times are about six or seven seconds.

● Reduced congestion. GSM networks can cope with eight times as much traffic as analogue systems. This reduces the possibility of congestion. PCN networks are also able to handle more traffic than can the

## analogue systems.

● Pan-European coverage. GSM is becoming the standard for new European digital mobile phone services and has been adopted in many other parts of the world. Handsets bought in one country can be used to send and receive calls in another through so-called roaming agreements with national service providers. Very limited overseas roaming is also possible for users of PCN services.

● Better transmission for mobile data. It is easier to transmit data over digital mobile phone networks than over their analogue counterparts.

Vodafone will be launching the UK's first GSM data communications service, Vodafone Data on 19 October.

Market researchers are predicting strong growth for digital mobile networks. Dataquest forecasts that there will be 8.31m GSM subscribers in Europe by 1996. High growth is also expected for UK PCN networks with Mercury's One2One gaining over 120,000 subscribers since its launch last autumn.

There are plenty of digital mobile phone services to choose from. In most European countries including the UK there are two competing GSM networks, and in a few, PCN networks have also been licensed. The disadvantage is that the handsets cost more than those for analogue services.

In the UK the main suppliers of GSM networks are Mercury's One2One or Orange from Hutchison Telecom are also expensive. Whereas analogue phones can be had for as little as £40 and are sometimes available free, PCN handsets usually cost between £149 and £299 depending on the model chosen. However, call charges tend to be lower for PCN than for GSM.

Handset prices are not likely to remain high for long. Diana Jones of service provider Mercury Communications Mobile Services, says "By Christmas, GSM handsets should be the same price as high-quality analogue phones - ranging from £99 to £299."

One way of getting a cheaper GSM handset before then is to shop around in Europe. Charges for phones vary from country to country, and depending on whether they are bought with or without airtime. So it is worth comparing prices.

But if you plan to use your GSM phone outside the national network you register with, beware of the huge mark-ups on cross-border calls.

These can add an extra 30-45 per cent to GSM call charges, according to Bryan Van Dussen, a senior analyst at the Yankee Group Europe.

Despite high call charges when abroad and patchy coverage in some countries, most early customers feel they get value for money in terms of convenience and savings on hotel phone bills.

Of course, high handset and call charges do not worry Hollywood mobile users. As well as hijacking a car before giving chase, they now take the mobile too.

Joia Shillingford

The market for office PABXs (switchboards) is growing so slowly that all the leading suppliers are scrambling to find new sources of revenue. Bryan Van Dussen, an analyst at the Yankee Group Europe, says the industry is almost dead, with only 2-3 per cent growth a year worldwide. However, two new technologies present opportunities for growth: wireless PABXs and multimedia (the convergence of sound, image, text and computing).

Wireless PABXs allow users to make and receive calls using cordless handsets. It makes no difference where abouts they are in the office, so long as they are within reach of a radio base station. One or more base stations will be connected to the office PABX, which links users to the fixed phone network.

The beauty of the technology is that companies do not need to throw out their old switchboard to use it. It is possible to buy an add-on device which plugs into a standard PABX and links it to one or more base stations. It is also possible for fixed-phone and cordless users to co-exist on the same switchboard.

This is important because not all company workers used cordless handsets, and because equipping a cordless user will cost more. According to Mr Van Dussen, the average cost of connecting an office worker to a standard PABX is \$350 including the handset and infrastructure. The cost of equipping a cordless user is about three times more expensive at \$1,000, and it can be more if a lot of base stations are required.

High prices help to explain why the wireless PABX market has been relatively slow to take off. Other inhibitors to growth include conflicting standards and a limited choice of products.

By the end of the decade, market analysts predict that up to a fifth of new office telecommunications equipment installed will be cordless.

"Wireless office equipment will grow from virtually nothing in 1993 to nearly 20 per cent of the market by the year 2000 while wireline-based PABXs (switchboards) and key systems dip correspondingly," said Frost & Sullivan, the US-based market research firm in a recent report.

Systems manufacturers such as GPT Communications Systems, a joint venture between Germany's Siemens group and Britain's GPT, tend to be more cautious suggesting that cordless systems could take between 10 and 15 per cent of the market by the turn of the century.

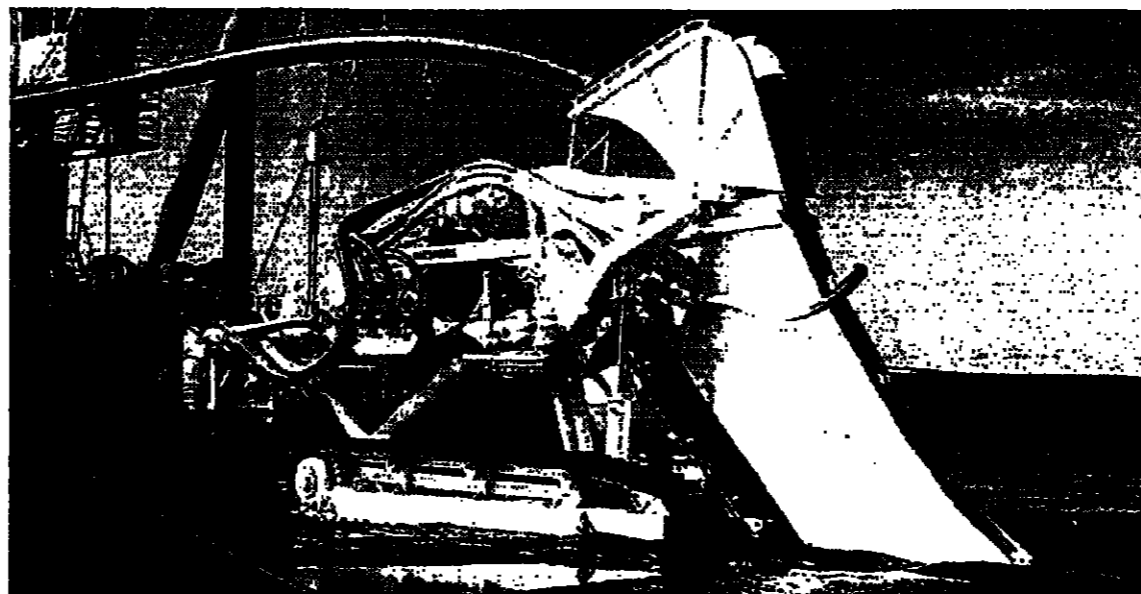
Either way, the projected growth of cordless business communications systems is impressive - driven by falling hardware prices and the perceived benefits in terms of mobility, flexibility and productivity.

The Frost & Sullivan report predicted: "The wireless office will gain popularity as the price of systems declines. Prime target end-users include salespersons, top management, employees in distribution and manufacturing firms and healthcare personnel."

The popularity of cellular phones and the emergence of personal communications systems will stimulate use of wireless handsets for in-building use as users increasingly seek the same convenience they are used to outside the office inside buildings.

Basic cordless telephones have been available for use in the home since the early 1980s. Generally these systems include a portable handset which communicates by radio with a single fixed base-station which is then in turn connected to the public telephone network.

In recent years technical advances, particularly the switch from analogue to digital radio transmission, has greatly increased the scope of cordless



Joia Shillingford lying power cables on the sea bed: the company uses cordless PABX technology from GPT Communications Systems

Joia Shillingford finds new openings in the switchboard market

## Widening the network

The development of desktop multimedia applications could also add lustre to the PABX industry. Two main multimedia applications involve the PABX, according to Mr Van Dussen. They are:

- Desktop video-conferencing and
  - Collaborative whiteboarding.
- The first enables PC users to see a video image of the person they are talking to on the phone. The moving video image is displayed in a "window" on their PC.

The second enables PC users in different places to look at the same image or text in a window on their PC.

As with a real whiteboard, they can annotate the image, which could be anything from a diagram to a spreadsheet. Whiteboarding and desktop video-conferencing can be used either separately or simultaneously.

Because such applications are now possible, US computer companies such as Intel, Microsoft and Novell

have started to become more interested in voice technology. This has led software companies such as Microsoft and Novell to try and set standards for the way PCs instruct PABXs. Each "standard" has its own supporters among computer companies.

Microsoft has defined Tapi (Telephony Applications Programming Interface) and Novell has come up with a rival definition, Tsapi (Telephony Services Applications Program-

ming Interface).

Novell and Microsoft are each hoping that their standards will be used to develop CTI (Computer Telephony Integration) applications, where computers and PABXs work closely together.

Mr Van Dussen describes his dream CTI application as a computer database linked to a PABX. His phone would be answered automatically and calls routed according to the phone number of the caller (this will be possible when BT's calling line identification service is launched).

A software program would determine from the database whether the incoming call should be routed to his voice mailbox, his secretary or directly to him. In certain cases, it would just hang up on the caller.

Such call-routing applications are useful to telephone-sales centres. There is also demand for CTI in many other areas, for example order-taking, where phone orders go straight into a computer.

The Yankee Group is positive about the opportunities for PABX suppliers to penetrate some of the new markets created by developments in wireless technology, multimedia and computer telephone integration.

It believes that Dect will grow rapidly as a wireless PABX application, rising from less than 0.1m lines installed in 1994 to more than 2.6m in the year 2000.

In addition, Cordless Dect-based phones, such as those sold by Siemens of Germany, could one day be used to bypass the local loop (such as BT's local phone network in the UK) and provide direct connection to long-distance carriers such as Mercury.

Joia Shillingford is Associate Editor of the Financial Times newsletter Business Computing Brief

Paul Taylor on prospects for cordless business communications

## Wireless office beckons

office systems enabling high-capacity systems using multiple micro-cellular base stations and capable of serving hundreds or even thousands of business users to be constructed.

The first large-scale business cordless systems were launched in 1992.

The advantages of cordless business telephone systems are fairly obvious. In particular, workers are no longer tied to the location of a particular hard-wired telephone extension and incoming calls have a much better chance of reaching their intended recipient.

Surveys have shown that up to 70 per cent of all business calls fail to reach their target on the first attempt often leading to what has been dubbed "telephone tag". Cordless systems can reduce this call failure rate substantially, improving efficiency and customer satisfaction while cutting cost by removing the need to return calls.

Ericsson, the European telecommunications equipment manufacturer, claims that cordless business systems can save customers up to 30 per cent of their bills as a result.

Cordless systems can also save on the costs of rewiring and other configuration operations which can be around 10 per cent of the capital cost of the system for organisations running medium-sized or large PABX systems.

In addition, as Multitone, the UK-based pager and cordless telephone system supplier, points out, cordless systems are extremely cost-effective to run once installed since there are no airtime charges, internal calls are free and external calls cost the same as from an ordinary desk telephone.



Vodafone's GSM service allows data to be sent and received using a digital mobile phone

Multitone's CS500 system connects directly to a PABX and so no expensive changes need to be made to an existing hard-wired system and the same desk telephones and extension numbers can continue to be used.

Recognising that many companies cannot justify the cost of covering a whole site with a cordless system, the CS500 also comes with paging software enabling handset users to roam outside cordless coverage and still stay in touch.

However, if cordless business systems are to flourish, there are several obstacles to overcome. In particular there are two main rival cordless business system technology stan-

dards. CT2 (Cordless Telephony 2) and Dect (Digital European Cordless telecommunications).

CT2 was the first digital cordless technology to be developed in the UK during the 1980s and has been adopted as an interim European standard. It is the same technology used for Teletext services in Europe and elsewhere.

GPT Communications Systems and Canada's Northern Telecom have been supplying cordless office systems which are based upon CT2 digital technology - BT also supplies re-branded Northern Telecom systems and Multitone's CS500 cordless system is supplied under an agreement

with Northern Telecom. The Canadian group, which is also developing a Dect system for up to 1,000-users in conjunction with Olivetti, launched its Companion CT2 cordless business systems in Europe in March last year and has sold over 1,000 systems in 18 European countries and the Middle East since then and over 2,000 systems worldwide.

CT2's supporters claim that it is a proven and cost-effective technology ideally suited to small and medium-sized offices. CT2 handsets currently cost about a third of the price of their Dect rivals and are likely to retain a price advantage because of the adoption of the technology outside Europe - for example, in the Far East.

The rival Dect standard is backed by ETSI (the European Telecommunications Standards Institute) and was designed to solve the problem of providing cordless phones in high-density business environments such as offices.

Five of Europe's largest telecommunications equipment suppliers - Alcatel, Ericsson, Nokia, Philips and Siemens - which between them represent nearly 70 per cent of the European PABX market adopted the Dect standard in March 1993 and the first Dect systems began to appear shortly afterwards.

Ericsson has been one of the most active promoters of Dect systems and launched its Freetel system in Europe last autumn although it has been selling similar systems outside Europe for some time.

Freetel systems have already been installed in manufacturing factories, hospitals and "offices of the future" such as Digital Equipment's futuristic headquarters in Stockholm.

In time, telecommunications strategists believe cordless office telecommunications systems will be integrated with other digital telecoms services including GSM (global system for mobile) and PCN services, and with wireless local area networks linking desktop computers, workstations and other devices.

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## TECHNOLOGY IN THE OFFICE 8

The future for mobile data is in niche applications, says Richard Handford

## Revitalising a stagnant market

The decision this autumn by the Department of Trade and Industry to invite bids for the UK's fifth mobile data licence caused amazement in an industry that has had to familiarise itself with unpleasant surprises since its inception five years ago.

"Anyone applying for a licence now would have to be crazy," was the reaction of one industry executive to the DTI decision to increase competition in a market where customers are today only a tenth of what was predicted three years ago.

The three existing operators - Ram Mobile Data, Cognito and Paknet - only have 5,000-10,000 customers between them compared to industry predictions in 1991 that a market of 100,000 would have developed by the end of this year.

The high aims were based on the assumption that mobile data would breach a huge market of business users. Any traveller away from the office, it was argued, would want to retrieve information from an office database or immediately input

new data, a successful sale, for example, rather than waiting to return to the office.

Instead, it appears the future for mobile data is in developing a number of niche applications, although not all of them popular. For instance, Ram Mobile Data's terminals are used by traffic wardens in a number of London councils who issue a total of 5m parking tickets each year. The wardens can send and receive details about illegally parked vehicles far more efficiently this way than by using alternatives such as a cellular telephone.

Other niche applications include emergency organisations such as the fire and ambulance services, parcel delivery com-

panies and Trafficmaster, the UK traffic monitoring system which uses the Paknet network to relay signals containing information about traffic conditions collected from roadside monitors to the company's control centre.

The system then uses a paging network to carry the same information on to its subscribers in their cars.

The radio-paging industry is casting around for new approaches to avoid being superseded by cellular operators who are offering increasingly competitively-priced handsets and tariff packages.

Aside from initiatives such as Trafficmaster, paging operators are looking at

two ways to revitalise a stagnant market.

One is to maintain pricing's price advantage over cellular telephones by introducing new, cheaper tariff packages. The other is to make the pager a more sophisticated product that offers similar services to a mobile data network.

This autumn has seen the launch by BT and Mercury - two of the UK's four paging operators - of a new kind of paging service first developed in Sweden.

The market certainly needs this kind of initiative. In the past year the number of subscribers has grown by only about 780,000. Mercury estimates the new services will add between 100,000 and 200,000

new subscribers.

The service, known as CPP or Calling Party Pays, is an attempt to widen the audience for paging services to include consumer as well as the business user.

CPP services eliminate one-off connection charges and monthly subscription leaving the user only having to pay the price of the pager.

The operator recoups the revenue lost on connection and rental charges by charging callers a premium price for leaving a message for the subscriber. Currently calls to pagers are billed at the standard local rate for calls.

BT has given its service an extra twist

by introducing it with a wristwatch pager - the first in the UK - manufactured by Swatch. It hopes the pager will deliver the same kind of youthful audience drawn to the One-2-One cellular service, launched last year.

The second new innovation likely to reach the UK soon is the launch of services based on a new digital technology that will enable operators to offer a service that will deliver longer messages at higher speeds than is now possible.

In addition, the new service known as Ernes (European radio message system) enables users to send and access information from office databases while they are on the move.

Aside from teething problems, such as the discovery that in Germany Ernes causes interference to television pictures, it is already available in France and will soon be offered in other European countries. It is likely to further add to the competition faced by the UK's mobile data operators.

Joia Shillingford looks at the increasing use of messaging systems

## Mechanical voices a mixed blessing

Susie, a New York-based stockbroker working for a European bank, kept leaving messages on the answering machine of a potential client. After six months, the client rang her and told her he only dealt with US banks.

Her story shows just how prevalent answering machines and voice mailboxes are becoming in US business, not only as a means for staff to receive messages when they are absent from their desks but also as a way of filtering calls.

Voice mail and answering machines are also becoming more common in Europe, where growing call volumes are turning the telephone into a mixed blessing.

According to UK high street retailer Dixons, among the most popular answering machines are those which add a date and time to each message (with a little help from a computer-generated voice). The cheapest of these is a £28.99 machine from Betacom. BT's Response 50 goes a step further by bleeping when any messages have been left.

But it may not be necessary to buy a separate answering machine at all. Increasingly, answering machines are being included in composite products such as Amstrad's model which combines one with a fax machine. The latest multimedia home PC from Compaq includes an answering machine with 12 segments - so that parents, for instance, do not have to waste time listening to messages meant for their children.

For the corporate environment, voice messaging systems provide similar features to

answerphones but can do much more. At their simplest, they allow callers to leave a message if the person they want to talk to is not available. By dialling the appropriate voice mailbox number (and a code), users can play messages back or forward them to another mailbox.

But all too often systems are

with spying on colleagues to see if they are changing their greetings regularly - for instance, when they are on holiday - and actually listening to their messages.

The penalty for breaking the rules is to lose your voice mailbox and once again be subjected to a barrage of calls.

Another potential problem



implemented poorly, leading to horror stories of "voice mail jail", where the caller is trapped in the system and bounced from one voice mailbox to another.

However, individual users can be at fault. As a consequence, some US companies have appointed "voice mail police". These are staff tasked

with voice mail security. This is because, depending on how they are set up, PABXs (switchboards) with integrated voice mail can be vulnerable to hackers.

If special tones are used to operate a voice mailbox, these can sometimes be used to operate the PABX. In this way, a number of hackers have used

US company switchboards to run up huge bills.

The Voice Messaging Educational Committee (VMEC), whose members include AT&T, BT Mobile, Octel Communications and VMX will publish a guide to voice mail security next month.

In spite of security problems, use of voice mail is expanding in the US. A study there by the voice systems consultancy Vanguard Communications says that the US voice mail industry grew over 20 per cent last year, with sales topping \$1bn.

Don Van Doren, president of Vanguard, says: "The bottom line is that voice mail improves communication, saving time and money."

In Europe the profile of public voice mail is increasing, largely because cellular phone operators provide voice mailboxes linked to users' mobile phones. The market for voice processing as a whole (including voice messaging) is growing at 35-40 per cent a year in Europe, according to Robin Scurlock, head of BIS Strategic Decision's messaging programme.

He says: "At this year's Voice '94 show much of the technology that had been promised was on display especially in the area of call centres and voice integration on the local-area network."

Call centre systems are designed to capture the three out of every four calls that the voice messaging industry estimates fail to get through first time. The systems are designed to allocate calls to the next free person in a teleshops environment and to provide a computer screen full of information on any customer that has called before. They can also provide a list of calls which need to be made.

In the area of voice integration, GPT launched a product at Voice '94 which allows users on a PC to work to get a list of all their fax, voice and electronic mail messages.

They can then use a mouse to click on the ones they want to see or hear. Suppliers which have (or are developing) integrated products for the desktop include VMX, Octel Communications, C3, Applied Technology, Dialogic, Active Voice, Radish Communications and Converse.

However, Elaine Cascio, a consultant at Vanguard Communications, warns that no one really knows whether users want to be able to see all their different types of messages at once.

There are many different

types of voice processing (of which voice mail is one). They go by a confusing array of names and there is some overlap between them. Audiotex is one of the simplest categories and is used for 0888 recorded information, such as racing results.

Another category is interactive voice response (IVR). This is the type of technology used in some home banking and home shopping systems. It might, for example, prompt the user to "press one to check your bank balance" or "press two to order a cheque book".

These systems effectively link a voice interface to a computer database. They allow customers to input and retrieve information either by using a touch-tone phone or by using speech recognition technology.

Interest in voice technology is growing as computers and telecommunications begin to converge. For example, PC software companies like Microsoft and Novell are mulling in and trying to set competing standards for CTI (computer telephony integration).

But national character plays a big part in the level of adoption. BIS says people in the



Southampton University's voice mail system, VoiceConnect, keeps students in contact with friends and relatives

Netherlands and Sweden are less keen to talk to machines than the English.

Americans are probably the most comfortable with speaking to machines. In Japan it might be hard to find an executive willing to leave messages on an answerphone for six months.

Scurlock says: "In Japan the receptionist often takes the message verbally and then records it on a machine."

"Copies of VMEC's voice mail security guide can be obtained from any VMEC member company or from Vanguard Communications in the US. Tel: 201 685 8000."

Reduced business travel is not the only benefit of video-conferencing

## Making savings all round

After a series of false starts, video-conferencing is taking off. Tumbling prices and smaller systems - including the first desktop systems - mean that video-conferencing can now provide a real alternative to business travel.

In 1984, a professional quality system would have cost £250,000 according to Phil Simmonds, marketing manager of GPT Communications Services. "Today, a professional quality system the size of a television set can be bought for around 10 per cent of that price," says Mr Simmonds. And it is possible to buy systems which are even smaller and cheaper.

There are three main types of video-conferencing system: large systems designed to equip video-conferencing studios for between £25,000 and £30,000; smaller roll-out (movable) systems for between £15,000 and £17,000; and desktop systems. BT, for example, sells a desktop system the size of a portable television for £5,999.

A lower cost option than using a dedicated video-conferencing unit is to add video-conferencing capabilities to a personal computer. Judith Jeffcoat of the research consultancy Ovum believes that between 1996 and the end of 1998, revenues from PCs equipped for video-conferencing will exceed those from conventional video-conferencing equipment.

An increasing number of suppliers have developed or are selling systems of this kind including Canada-based Northern Telecom (with the Visit system distributed by UK computer dealers P&P), US semiconductor company Intel, AT&T GIS (Global Information Solutions), BT, IBM, Apple, Picturatel, Olivetti and Griffin Sight & Sound.

Some computers now come fully equipped for video-conferencing, allowing users to transmit live video images of themselves to other, similarly-equipped users, and to see on their PC the person they are talking to. For example, Sun Microsystems sells a Unix workstation which includes camera, real-time video capture and compression and a storage disk.

But most users will have to buy a special kit if they want to carry out a video-conference in a window on their personal computer.

For example, Olivetti, IBM, BT and ICL sell kits which include a small video camera which sits on top of the PC, a card which slots into the PC and software (some of the

hardware in these kits was developed by BT).

The kit makes it possible for users to transmit still or moving video images, photographs or sound. In most cases users will also need an ISDN (digital) phone line to enable them to carry out a phone conversation and transmit data (such as video images) at the same time.

Many PC-based products allow people engaged in a video-conference to point to or edit information they can both see on their screens. Intel says that with its system, users at far-flung sites can edit a report together, both looking at the same version on their screens.

## Users of studio-based systems find that video-conferencing promotes regular, shorter meetings

The systems are modular so US users can either buy the ProShare shared editing software separately or the full kit.

New products are also coming to the market. In late October, BT plans to launch Presence, which it describes as the UK's first self-contained desktop ISDN videophone and the VC6000 roll-out video-conferencing system.

A report from the Economist Intelligence Unit, International Business Travel: a changing profile, suggests that video-conferencing will gain popularity. "Video-conferencing is perceived to have several benefits and it is perhaps the ability to streamline travel costs that is considered to be the major one," says the report.

Benefits can include:

• Time savings. Citibank Europe saves 300 man hours of

travel time per month by using video-conferencing for Europe-USA staff meetings and its chairman's speeches.

• Cost savings. ICL, the UK computer company owned by Fujitsu of Japan, says it makes 50 per cent savings on travel costs through using video-conferencing for board meetings and links with Japan.

• Faster product development. When Ford of Europe introduced video-conferencing it helped to cut down product-development times. Staff at different sites can hold a video-conference to sort out a problem, rather than travelling for a day.

• Greater team spirit. Ford

Mr Simmonds says: "They aren't good for the initial meeting with someone - it's better to meet people first in the flesh." This is especially true of PC-based systems, which usually provide video images at 15 frames a second. At this speed, images will be jerky, so if business contacts make even small movements, it will look as if they are swaying around wildly.

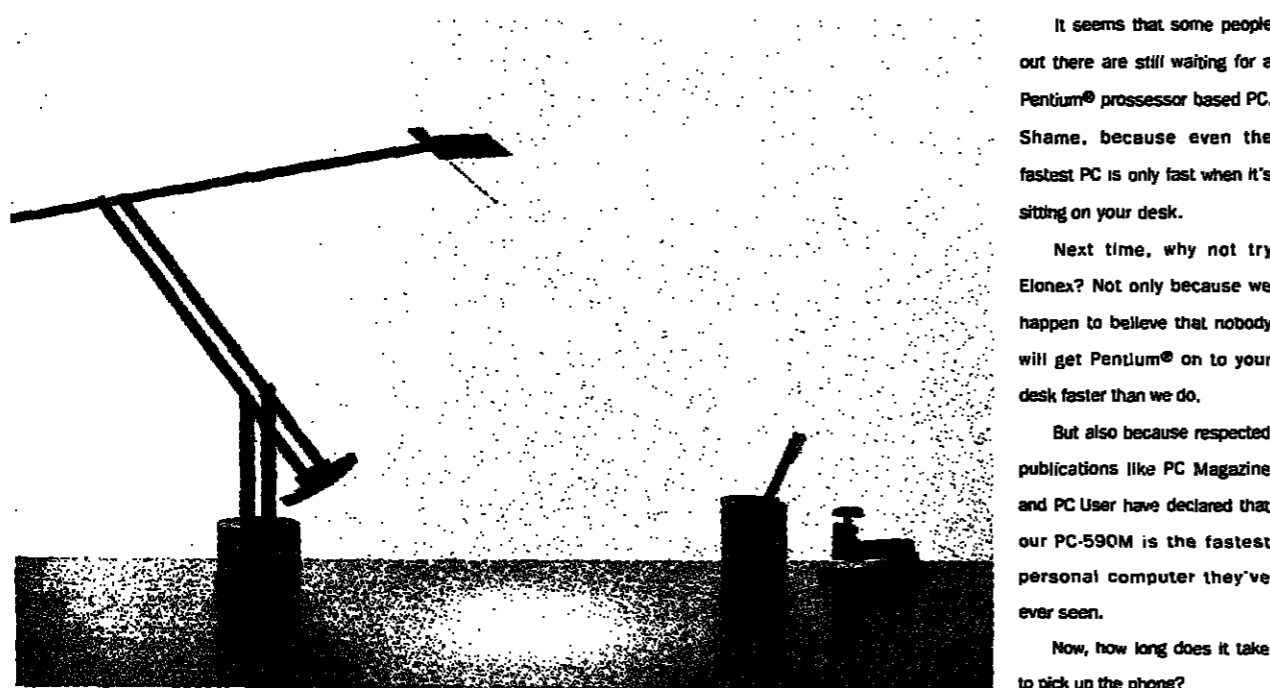
As well as keeping still, it is also important to try and establish eye contact by looking into the camera, whether in a one-to-one or a large video-conferencing meeting. In larger, "multipoint" video-conferencing meetings, people should speak one at a time, because it is harder than in face-to-face meetings to listen to a babble of voices.

Adrian Butcher, BT's general manager for videotelephony, says a number of factors must be considered when conducting a video-conference, but "multipoint tends to encourage the disciplines that ought to prevail in a business meeting. People tend to think about what they are going to say before they say it, and there is usually a chairman in charge".

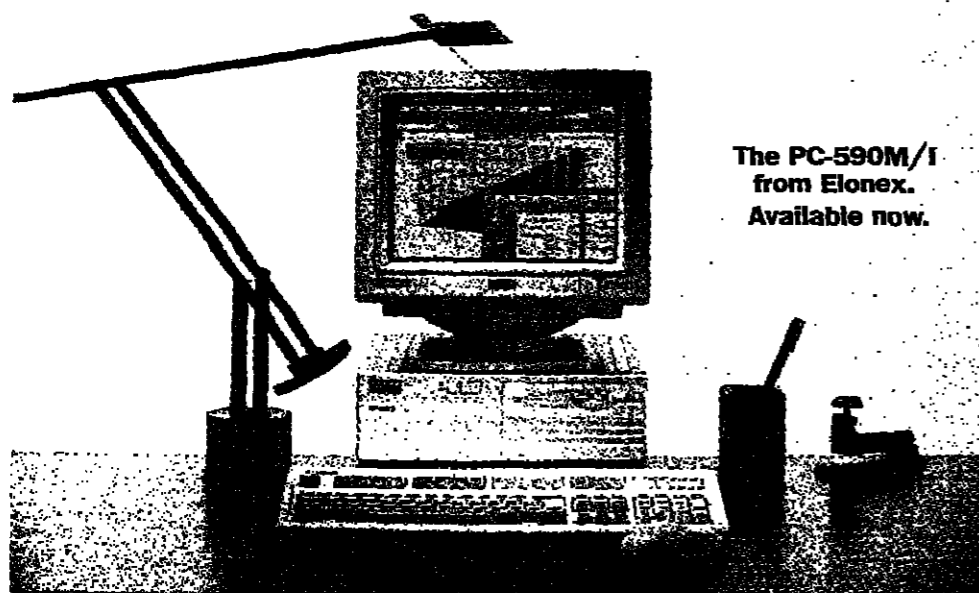
He believes that, unlike many technologies, video-conferencing systems (especially the smaller ones) can sometimes pay for themselves immediately through savings in travel costs.

But he does not think that businesses should look at cost savings alone. "The real power of these systems comes from faster decision-making," he says. "Suddenly, dialogue can proceed at the speed of people's diaries."

Joia Shillingford



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The electronic marketplace is on its way, writes Joia Shillingford

## EDI traffic increases

The growth of paperless trading using electronic data interchange (EDI) and electronic mail is having a profound effect on the way some businesses operate.

EDI involves the exchange of structured business documents, such as orders and invoices, directly between computers. It is used mainly for inter-company communications, where cutting out paper can significantly speed up the processing and transmission of information.

But "the most significant application of EDI worldwide is to make reductions in inventory," says Brian Dearing, a Europe-based vice-president at US EDI supplier Sterling Software.

"For example," says Mr Dearing, "clothes retailers are trying to improve profitability by cutting down on inventory. Ideally, they only want to re-order the stuff that sells otherwise they have to make huge markdowns at the end of the season."

But each time a garment is re-ordered that's an administrative task. So unless the process is automated, it isn't practical to keep really low levels of stock. One solution is to generate an EDI order every time an item is scanned at the checkout till.

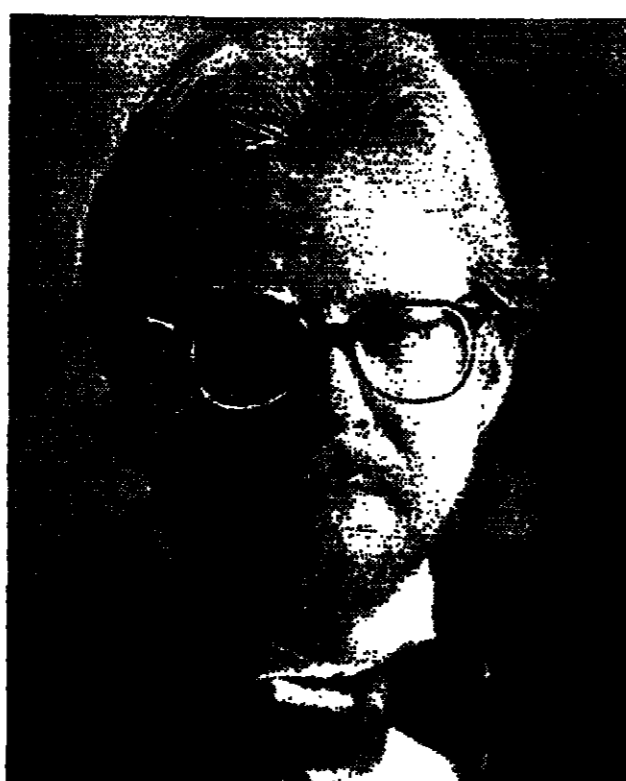
In addition to improving profitability, a low inventory policy means that no stockroom is required. Examples are S&K Menswear in the US, which orders goods in the minimum quantity and then re-orders what has just sold. And Victoria's Secret, the US lingerie company, which also requires no stockroom after implementing a low-inventory policy.

Mr Dearing believes that using EDI to improve asset management will contribute far more to a company's profitability than simply using it to cut costs in the accounts department.

For those who are planning to use EDI, there are a number of third-party value-added network services (Vans) to choose from. In essence, these take computer-generated orders or invoices and send them to trading partners electronically.

EDI service providers include General Electric Information Services (Geis), IBM, INS (now wholly-owned by Geis), BT, AT&T and, most recently, Sterling which has made its US EDI service available in Europe as Commerce Network.

Some EDI Vans also offer electronic mail and, conversely, some email suppliers



Brian Dearing: "the most significant application of EDI worldwide is to make reductions in inventory"

offer EDI-like applications. Mr Dearing says: "We've seen email used in EDI communities where a retailer or manufacturer has a number of suppliers and wants to tell them it has a new purchasing manager, or that it's going to shut down for a few days."

"It's clear that greater use of email for electronic trading is going to come, but a lot of the things customers want to do really lend themselves more to

growth for electronic mail services, such as the Internet. It forecasts that total European email revenues will grow at 53 per cent a year from £223m in 1993 to £453m in 1997.

A big part of this growth will come from new users signing up to use the Internet system. Extensively used by the research and academic community on a not-for-profit basis, the Internet now has at least 15m users around the world,

says: "Recent reports estimate that over half of Internet's users are now commercial bodies, yet there are still many barriers to, and much debate concerning, the commercial use of the Internet."

For example, the National Science Foundation Network Internet backbone (the NSFNet) deems for-profit activities to be unacceptable. But commercial suppliers are forming groups which can interconnect without such restrictions.

As a result an increasing number of fee-charging services are appearing. These include Clarinet - an electronic publishing service, providing news and information, plus live news from the UPI wire service.

Many major online databases, such as Dialog and Lexis can also be accessed via the Internet.

The Internet is often mentioned as an early example of the information highway. As conceived by US president Bill Clinton and vice-president Al Gore, information highways - national information networks - will carry information, entertainment, interactive games, and services such as home banking and shopping into homes and businesses.

The plan is that users will plug into these highways using multimedia terminals (which combine television, images, sound and computing power) in the home or office. Alternatively, they will link up via "smart" boxes used with their television sets.

But as well as representing a huge business opportunity for all manner of industries - such as entertainment, publishing, financial services, telecoms, computers and consumer electronics - information highways also present a threat to established ways of offering services.

For example, Mel Simon, IBM venture manager for the information super-highway, points out that the presence of a national information infrastructure would make it relatively cheap for new direct suppliers (such as the telephone-based bank First Direct and Directline insurers) to enter the market and compete for business.

But until computer networks, such as the Internet, become easier for ordinary mortals to use, both the threats and the commercial opportunities will be more imagined than real.

*Desktop messaging: strategies for the corporate market is available from Ovum. Tel: +44 71 255 2670*

### A big part of the growth will come from new users signing up to use the Internet system

electronic bulletin boards." These allow information to be "posted" in an area of the EDI network where anyone can look at them.

The research consultancy Ovum predicts that European EDI network service revenue (including software and support for customer-premises equipment) will grow at 25 per cent a year from £260m (£322m) in 1993 to £588m in 1997.

By then, it expects 90 per cent of European EDI traffic to be based on the international Edifact standard, as compared with less than 50 per cent last year.

Ovum also predicts strong

growth for electronic mail services, such as the Internet. It forecasts that total European email revenues will grow at 53 per cent a year from £223m in 1993 to £453m in 1997.

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Julie Harnett on the shortage of staff needed for training programmes

## Multimedia skills in demand

Within four months of implementing an interactive multimedia training project, the Deutsche Bundespost Postdienst in Germany had saved over DM14.2m in time and travel costs.

By far the largest multimedia installation in Europe, with more than 2,000 "Learning Stations", the system was custom-built by Videologic using digital video technology to provide a cost-effective solution for the training of a widely dispersed workforce of more than 350,000 people. The initial investment had paid for itself after putting just 100,000 staff through the first two learning programmes.

In the training environment, the integration of personal computers with digital video, audio and still images makes learning new skills an exciting and positive experience.

Studies show that pupils learn new skills faster, and information retention rates are higher than they were with traditional aids such as flip-charts and marker pens.

As a result the future of multimedia, particularly as a training aid, is assured. According to Alan Binnie, recruitment director of consultants Recruit Media, the multimedia markets is expected to top £7bn worldwide this year.

He says: "Sales of multimedia PCs with CD-ROM drives grew by over 150 per cent last year and, if such drives were fitted to just a third of all PCs expected to be sold in the UK in 1995, the potential market would increase by 500 per cent to something like 1.5m." However, he warns that as the rush to supply the market takes off, so too will the demand for quality staff.

"Multimedia mixes sound, visual images and movement, and the creation of a single product involves a whole range of new skills from computer programming to graphic design. Lack of those skills could hold the UK back."

That view is held by the West London Training & Enterprise Council which conducted a survey last year and found in the IT field alone a national backlog of 50-100m man-days of computer skills training. Moreover, it estimated that catching up through conventional methods would cost £10m-20m. New thinking is called for, the Tec's report concluded.

A growing number of organisations are keen to address the problem using new technology. Recruit Media says that 60 per

cent of companies have said that they intend to employ

multimedia staff within the next 12 months.

Unfortunately, 40 per cent of those already travelling the multimedia route are experiencing difficulties in finding the right staff.

Mr Binnie says: "We are getting companies like BP, the Automobile Association, BBC Enterprises and ICL coming to us for trained, flexible and creative staff and it is getting increasingly difficult to find them."

"Now that multimedia has progressed from a cottage industry to one of global significance, we must address that

code techniques. Each laser disc can store up to 36 minutes of video or up to 54,000 still frames and photos, or a combination, with each item or section given a unique barcode for fast access purposes.

By running the barcode pen over identical supermarket-style barcodes in the reference book, the relevant section of the programme will appear instantly on the TV screen, complete with relevant photographs, slides, diagrams and text.

A growing trend among trainers and lecturers is the use of a PC to create their own training presentations. The addition of an LCD projection panel provides the ultimate flexibility, enabling computer presentations to be prepared in advance then altered quickly and easily up to the last minute, an impossible task if slides or OHPs have to be produced.

Distance learning, whereby individuals can learn new skills at any time at any location is developing.

The one problem with it is the difficulty of interaction between trainee and tutor. QData believes its development of the Marc PC-based software program could be the answer. It enables a tutor to deliver training materials and exercises to a group of dispersed trainees who can then participate in one-to-one or group training sessions.

The tutor can take control of all screens on the network, or can ask remote trainees to take control of the host computer and perform certain tasks while the rest of the trainees watch. Messages can be sent to all trainees simultaneously and work completed can be printed out locally or remotely.

developed by IT staff who use AimTech's IconAuthor, a more complex authoring tool that has already proved its worth in developing interactive training courses for cabin crew.

Video has long been used in the training environment. But it can be time-consuming winding tape backwards and forwards trying to find a particular section. Interactive video is one answer but the need to implement sophisticated computer controls has, until now, made it an unrealistic proposition for the mass market.

An interesting development from Japanese electronics giant Pioneer is an interactive LaserDisc combined with bar

It's not what you've got, it's how you access it. In the fast expanding world of electronic information services, that is becoming the rule which differentiates service offerings.

Business information has been available on-line for many years from service providers such as Official Airline Guide, Infocheck, Kompas Online, various newswires, and the Financial Times's Profile news and reports database service. Most are supplied through third-party network providers such as Compuserve, as well as by direct connection. But none of the services have yet achieved the widespread use that they deserve.

One reason is that they have

proved difficult to use, often providing users with very little on-screen assistance. "Most on-line databases are not particularly friendly, and by design are geared towards information services professionals," said Mike Sullivan, of Reuters business information products group.

Another issue is charging. Services traditionally charge users by the minute, making searches expensive. And researchers may have to access more than one database to conduct a comprehensive search - for example, to find competitive product information they would check news archives, companies listings and research reports.

Monica Horten finds fierce competition in electronic information

## Ease and speed top the list

Reuters Business Briefing, a new Reuters service launched last year, has improved the user interface with new Windows-based software. It lets people search its 600 sources of information by clicking through pull-down menus of subject codes. It also has a simplified charging structure - a monthly subscription of 495, for which users get 20 hours free search time.

A Windows interface is becoming a *rigor* for all new information services. According to Mr Sullivan, users today tend to be business executives, who need to search data for themselves. The executives demand that a system is easy to use. In the past, the typical user was a librarian - an information professional - who did the search at the request of an executive.

Users also demand fast data retrieval. Business Briefing claims to pull up data in less than three seconds. So does a rival service called Tel-Me from Birkenhead-based

start-up company Phone-Link. Tel-Me's concept is to take a number of commonly used databases and develop a common interface to make searching simpler. The 10 services offered include the Automobile Association and BT databases, as well as UK railway timetables, companies database, Infocheck, and news wires.

The most immediate rival to Compuserve is the Internet, which claims to have 30m users worldwide.

Tel-Me charges only 300 annual subscription, but adds a fixed charge per data retrieved: from 15p for a phone number, up to 24p for a company report.

Compuserve, the on-line service based in Columbus, Ohio, not only has a Windows interface but uses a special interface to third-party databases which makes them easier to

use than the original service provided direct from the information provider. And it lets users save information to their hard disk, so they can read it off-line, cutting on-line costs.

Compuserve's philosophy is to offer as much variety of information as possible. It has more than 2,000 databases, including the Associated Press, Deutsche Presse Agentur and Press Association newswires and business services such as Dun and Bradstreet, Kompas Online, Ertel Financial. Market reports from Mintel and US and UK trade marks are also on the system.

Users have to pay each time they access these services - except for the newswires which are provided free with the \$7.95 monthly subscription.

The advantage is that there is no need to pay an individual subscription to each database. So a user can do a credit check, look up a share price, get a company report and so on, with relative ease.

Compuserve has a great appeal for smaller businesses, which cannot afford subscriptions to so many services at once. It has made a concerted drive into European markets in the past two years and has made the greatest inroads in the UK and Germany, where it has 65,000 subscribers in each country.

"There are up-market bulletin board services and there are high cost business services, which sell direct. The wedge is in the middle where people want a broad service," said Neil Laver, of Compuserve's UK office.

The most immediate rival to Compuserve is the Internet, which claims to have 30m users worldwide. However, the Internet began as a network for academics and boffins, and this remains its prime function.

According to UK company Pipex, which supplies Internet connections, the leading business information suppliers have yet to come on-line.

Some, such as Dow Jones and Dun and Bradstreet are in the process of connecting.

Industry observers point out that searching the Internet can be difficult. It has no central organisational focus, which means that technical help may be minimal, depending on the supplier offering the connection. It may also be complicated to hook up to some of the information suppliers.

Commercial information suppliers will not offer their services free of charge - as is the academic information - and users may have to contact

The client list for the London-based Maid system includes 93 banks and a third of the UK's largest companies

the information supplier directly to obtain an account. This is not necessary on Compuserve.

Neither is it necessary on Maid, a London-based company which claims to offer a much more intuitive means of searching multiple databases. With Maid, one can search all the databases on the system - including news wires, com-

pany checks, stock broker reports and research material - just by entering a single query. Thus, if one enters "telecommunications in Thailand", it will provide news cuttings, broker, company and analyst reports that are relevant.

Maid has also invested in a novel indexing system. Professional indexers provide links between information which is related even though the actual word being searched on is not included. For example, if asked to search on "toothpaste" it would pick up an article on oral hygiene that did not mention the word "toothpaste". But clearly, the article would be relevant for someone interested in the subject.

According to founder Dan Wagner, customers are switching from other services to Maid. So far, the company has only targeted large financial institutions and major companies.

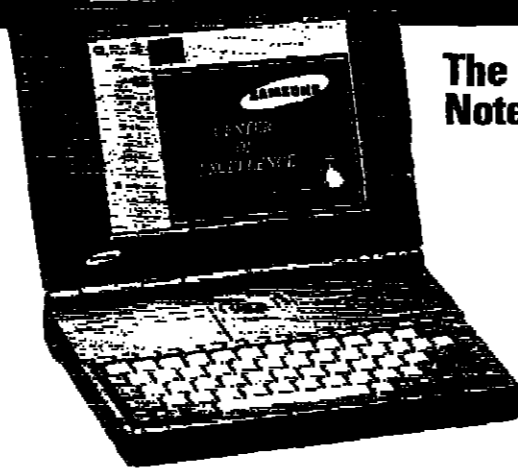
The client list already includes 93 banks, and one third of the UK's largest companies. However, it will be made available for smaller businesses next year, when a Windows version of the interface software becomes available.

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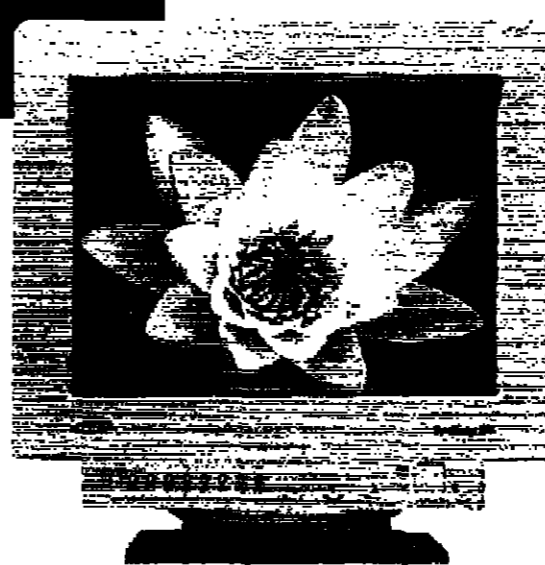
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## TECHNOLOGY IN THE OFFICE 10

**D**evelopers came late to the world of high technology. Despite increasingly frantic urgings from tenants and architects, they have only recently started producing buildings which can cope with the computer age.

Now, however, they face a barrage of complaints that the pendulum has swung too far. Many modern office blocks are too sophisticated, say the engineers that face the task of running them. They also burn a large hole in tenants' pockets. Ironically, a groundswell of disdain remains about the poor standards of most buildings to cope with office technology. Many high-tech companies complain that they still find it hard to track down suitable premises. Even non-technical ones groan at the difficulties of fairly simple internal reorganisation of desks and equipment.

A computer on every desk was considered a Star Wars dream until the mid-80s. But the "Big Bang" financial revolution changed all that. Large groups went wild in the scramble for a share of deregulated markets. Everyone expected to win a big slice, which meant grabbing more office space.

This coincided with a switch to computer-based dealing in securities, currencies and a host of other markets. Big dealing floors became the norm in new City blocks. But even the most mundane office was filling up with new technology as

Increasing use of technology has presented problems to developers, says David Lawson

## Tenants look for office flexibility

equipment prices fell. By the end of the decade, Star Wars was no longer a dream. This sea-change in working methods transformed designs of certain buildings. It was well known that electronics produce heat - but hate high temperatures. Computer rooms had been sealed and air-conditioned for years. Now that became the norm for a good deal of general office space, fitted with false ceilings for ducting, sealed windows to keep in expensively-cooled air and huge plant rooms on the roof.

Electronics also need miles of cables, and raised floors became the rage. At one time designers were proposing enough space for a service engineer to walk through without disturbing the drones above.

But all this costs money. Central London rents doubled during the boom - partly to pay for the new services. Running costs also soared. Then came the slump, and profit-strapped tenants began to worry about these high occupation costs.

By then, however, developers had got into their stride and were offering more and more sophisticated buildings. Air-conditioning became the norm, even in buildings well outside the city centres, where it was justifiable to seal buildings against pollution and noise.

Engineers and surveyors also started to question whether all this expensive sophistication was really necessary. Peter Hill of the Building Research Establishment Energy Conservation Support Unit (Brescu) examined how office equipment was used in 74 British companies. He found that manufacturers vastly over-estimated the power demands - and therefore heat output. Staff also tended to use equipment such as PCs in very different ways, so power consumption ranged widely from 50 to 250 watts per person.

Developers ensure they can offer speculative buildings to the widest group of potential tenants, so they made sure power could be provided at the top of this range. Air-conditioning designed to cope with this higher figure was, therefore, con-

sistently running below capacity for the average tenant. Users found themselves paying too much for the original system then extra for running it inefficiently.

Efforts are now being made to adjust buildings closer to tenant needs by bringing occupiers into the planning process. The British Council for Offices, a group of agents and developers, has also produced guidance notes that will avoid pitfalls.

The potential for savings shows up in a scheme being handled by cost consultants AYH Partnership, which reduced the power loading for one proposed London building from 25 to 15 Watts per sq metre. That will cut future maintenance and running costs by 80,000 a year.

Over-specified buildings will be more appreciated as power consumption rises to around 300 watts/person by the end of the decade. But this could be a brief respite, as the move to "green" PCs will cut that back to 200W in the following 10 years, according to Brescu.

Many high-tech businesses, however, are more concerned that buildings fall below

the specifications they need. Quality Software Products, the recently-floated publisher of accountancy packages, was disappointed to be forced out of its Leatherhead offices. The company had spent a great deal of time and money altering the building to cope with computer equipment, but needed space to grow.

**F**inding a suitable replacement was not easy, says QSP, although it eventually tracked one down one at Leatherhead's Regent Park which had been designed well enough to take the endless cabling, specialised lighting, security systems and the Lan and Wan technology required.

This was at least an advance on the 1980s when the task proved impossible in Gateshead, the company's birthplace. QSP had to build its own headquarters because developers had nothing suitable to offer. Things have not improved much today, as most of the suitable buildings are concentrated in the south-east.

One of the main problems is finding a

building flexible enough to take the constant changes demanded by modern businesses, says Richard Hannam of QSP. "You literally need to be able to shift walls over a weekend as teams are moved around," he says.

Cabling is also a big problem for the modern office. Within the first year of occupation the average business moves half the work positions, according to Stephen Hill of Oscar Faber Information and Communications. That continues with an average "churn" of 30 per cent a year.

More than half these moves require recabling, costing up to 400 per staff member. Designers are now trying to solve this problem with the introduction of structured wiring schemes under which a wide variety of power, data and other cabling can be merged. These schemes pay for themselves within two or three years by cutting the cost of churns to 20 per person, says Mr Hill.

Companies will need to take a much closer look in future at whether this kind of scientific approach to fittings has gone into offices they are seeking. High specifications may appear a godsend for those desperate to find buildings geared to high technology, but they must be appropriate to future needs.

The main criterion should be flexibility to change - either up or down the technology ladder. Whether developers can come up with the goods is another matter.

Monica Horten looks at the health risks in using office equipment

## Systems are under scrutiny

The mouse, a harmless looking device used by millions of people to control their computer software, is the latest piece of electronic equipment to come under scrutiny for health and safety reasons.

It is the subject of an international standard covering health and safety for high-tech offices being drawn up by national standards bodies worldwide, and it will correlate with EU requirements.

Recent studies have shown that using a mouse can cause injuries, says Bjorn Malmberg, technical co-ordinator at ICL Personal Systems. Most people place the mouse to one side of the computer, where they have to extend their arm to use it. The slight clicking action works muscles further up the arm, even though most people are not aware of it. The further one has to stretch to hold the mouse, the more strain is put on those muscles.

"Some applications require you to use the mouse a lot, and you can get inflamed muscles," said Mr Malmberg. He recommends placing the mouse as close in to the shoulder as possible to avoid the condition, which is known as tennis elbow.

Another condition caused by the use of a mouse is carpal tunnel syndrome. The symptoms are tingling feelings and pain in the thumb, index and middle fingers and a weakening of the thumb. Carpal tunnel syndrome can happen to mouse users if

they rest their wrist on the desk while holding the mouse for extended periods. This position pushes the wrist joint back at an angle, causing pressure on the nerves which transmit signals between the hand and the brain.

Some mouse products have been designed to allow the hand to rest in a more natural position. The Dextra mouse from Logitech, for example, is designed to raise the wrist position. It costs about £15. The Microsoft Ergonomic mouse costs £38. Mouse mats with a raised surface at one end are also available, for about £10.

### Extended use of computer keyboards can cause a variety of injuries

Similarly, new-style computer keyboards, designed for comfort, are coming on to the market. Injuries caused by extended use of computer keyboards include carpal tunnel syndrome and repetitive strain injuries. Mostly they occur where the user performs repetitive tasks in a position which cramp the hands, wrists or shoulders. This may be due to poorly designed equipment or to poor posture, or both.

Software company Microsoft has just

launched its Natural Keyboard. Shaped like a wave with the two halves of the QWERTY keys sloping away from one another at a 40 degree angle, it also has a sloping piece of plain plastic along the front, intended as a palm rest and a pop-up stand underneath to act as a wrist-rest.

Initially, the keyboard feels strange. But Microsoft claims that the slope puts the shoulders in a more relaxed position than the conventional keyboard. The shoulders are opened out, instead of being hunched up. The pop-up wrist-rest - Microsoft calls it a wrist leveller - forces the wrist in a slightly downwards-sloping position for those who like to rest their wrists while typing.

A rival product from US manufacturer Key Tronic uses a system of mechanical levers underneath the individual keys to create a softer landing for the fingers. Hard contact switches used to work the keys create a mechanical resistance to the finger on conventional keyboards, which also make the finger press directly down on the key - an unnatural movement.

The Key Tronic Pro Touch keyboard allows the fingers to arch over the keyboard in a naturally comfortable position.

ICL's ergonomically designed keyboard helps minimise the strain on muscles in the hands and forearms with a curved, sloping surface. It also incorporates an



Microsoft's claims that the sloping Query keys of its "Natural Keyboard" puts the shoulders into a more relaxed position than does the conventional keyboard



Wearing a headset with a telephone microphone leaves the user with both hands free

phone microphone, could be the solution because it lets the user have both hands free.

According to Stephen Murphy, of headset manufacturer Plantronics, headsets are governed by strict regulations on sound quality. But headsets can be expensive, with starting prices at £150 from either Plantronics or rival manufacturer Rascal Acoustics.

However, all manufacturers point out that improved equipment alone will not prevent any of the debilitating medical conditions.

"Our keyboard does not prevent repetitive strain injury. Just as you don't lose weight by drinking diet Coke," said Richard Teversham, hardware product manager at Microsoft. Mr Teversham believes that telling people how to organise the overall work environment, will help them to help themselves.

For example, a desktop computer should be placed at an appropriate height for the user. A footrest - costing between £15 and £40 - reduces the strain on legs and feet.

A chair with built-in lumbar support - costing between £100 and £150 - supports the back. Lighting should not cause glare or reflections on the screen. And users need to be educated to take breaks from keyboard or mouse work and to maintain a good posture.

Alan Cuthbertson, an independent consultant, pointed out that all employers in the European Union have a legal responsibility to educate their employees about high-tech health and safety.

This follows the European directive 90/270 which was passed in 1992. Member states were required to introduce legislation by January 1993, and organisations have been given until 1995 to bring their offices in line.



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# ALUMINIUM

Car makers express  
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Wednesday October 26 1994

## Prices bounce back after global deal

Kenneth Gooding describes how the industry took steps to overcome the problems caused by the huge increase in aluminium exports from Russia

Road signs are disappearing again. Thieves know that the signs are probably made of aluminium, one of the few widely-used materials worth stealing. There is hardly a better indicator that aluminium prices are going up and the industry's state of health is improving than this disappearing practice. If prices go on rising as they have in the past few months, it won't be long before the thieves become more daring: in the 1989 price boom one night in Hull, in the north of England, an entire canal footbridge disappeared.

The rise in aluminium prices – by more than 50 per cent since last November – was prompted by production cuts, rising demand and investment fund interest.

Less than a year ago, prices were at an all-time low in real terms, and the industry was suffering. Producers worldwide were experiencing heavy financial losses. More than half the west's aluminium smelters were not even covering their day-to-day operating costs.

"It seemed that, if the end of the world wasn't going to happen tomorrow, it would certainly come next week," said Mr Lloyd O'Carroll, economist at Reynolds Metals, the world's third largest aluminium group. The industry's woes were not caused by the global recession. Demand for aluminium continued to reach record levels, as it has every year since 1983.

In any case, the industry had prepared itself to cope with the inevitable ups and downs that a cyclical commodity has to expect. What took it – and everybody else – by surprise was a massive rise in aluminium exports from Russia, following the collapse of the for-

mer Soviet Union in 1991. Russian aluminium exports to the west tripled in 1991 to 1m tonnes, and rose to an estimated 2m tonnes in both 1992 and 1993. This was equivalent to about 13 per cent being added to western world supply at incredible speed – usually the industry gets a three-year warning of new capacity, because it takes that long for a new smelter to be built and started up.

In January 1989, before the Russian aluminium invasion, stocks in London Metal Exchange warehouses totalled only 136,000 tonnes, and the LME aluminium price was \$1 a lb (\$2,204 a tonne). Last November, as LME stocks climbed towards a record 2.5m tonnes, the price had dropped to 47 cents (\$1,036 a tonne). Yet in recent weeks it has been above 77 cents a lb (\$1,700 a tonne).

The industry itself helped to create this remarkable recovery. Since last November, it has announced plans to cut 1.25m tonnes of capacity, either permanently or temporarily – 500,000 tonnes of this in the west.

These cuts were prompted by an unprecedented trade agreement between the European Union and five of the largest aluminium producing countries – Australia, Canada, Norway, Russia and the US.

A memorandum of understanding, signed in Brussels in February, identified a global oversupply of between 1.5m and 2m tonnes a year, and suggested cuts of that size should be made for between 18 months and two years, to restore the balance of supply and demand. Russia agreed that if cuts were made in the west, it would cut output, by

500,000 tonnes a year.

Although Russia and western producers are unlikely to deliver all the cuts that were hoped for, the deal laid the groundwork for a recovery in the market.

This attracted help from an unexpected quarter – the investment funds which were casting round for something new to invest in at a time of falling bond prices and weak stock markets. They decided to put some of their cash into base-metal markets.

"The funds' intervention was unprecedented, incredible in its size and volume. It was beautifully timed and their analysis that the aluminium market was due for a swift recovery was spot on," says Mr Roger Scott-Taggart, director of research at Alcan, the world's second-largest aluminium group. "People in the industry, peering over the rim of the trenches, didn't believe there would be a serious recovery this year. But the funds created that recovery on the back of a much better fundamental market balance."

The market's underlying strength was clear for anyone to see. Annual growth in demand did not go into reverse, it merely slowed from 3 per cent to 1.5 per cent.

Partly this was because aluminium has a wide variety of uses. Packaging is one of its best markets – the metal is easy to sterilise for food and medical applications; it is an excellent barrier against liquids, vapours and light; it is non-toxic and imparts no taste or odour. There has also been good growth in the use of aluminium in electrical wiring, construction and in the transport sector (aeroplanes, trains

and automobiles.)

Global growth in demand for aluminium this year has set a cracking pace, led by the US where shipments of primary metal rose by a remarkable 11 per cent in the first half. Reynolds' economist, Mr O'Carroll, suggests western world consumption will probably rise by 7 per cent this year to 18.7m tonnes. He adds: "We are probably at the beginning of a three- to five-year up-cycle for aluminium."

He sees global annual demand rising at between 3 and 5 per cent. This growth will come from beverage cans and cars in particular. Nearly every beer and fizzy drink can in the US is made from aluminium, where once

they were tin-plated-steel, so any growth there will have to come from winning business away from glass and plastic containers. However, other parts of the world offer tremendous opportunities for the aluminium can.

Mr Richard Holder, Reynolds Metals' chairman, is predicting that the global aluminium can market will grow by 65 per cent by the year 2000.

As if that were not enough, aluminium has another "avalanche" market developing after many years of careful preparation – the use of more aluminium in cars. The amount of aluminium in the average car has doubled from 32kgs (70lbs) in the late 1970s to 68kgs (150lbs), and even the

most conservative industry forecasts see it doubling again by 2010.

In the US, this trend is being driven by ever-tightening fuel economy targets set by the government. Aluminium's light weight enables car makers to meet these targets without reducing the size of vehicles. Consequently, the US Aluminium Association is predicting that aluminium in the average American car will rise from 210 lbs at present to 350lbs by 2000.

Reynolds' Mr Holder suggests that next year shipments of aluminium in the US to the transport industry will reach 5.16m lbs (2.4m tonnes), and for the first time will top those to the packaging industry –

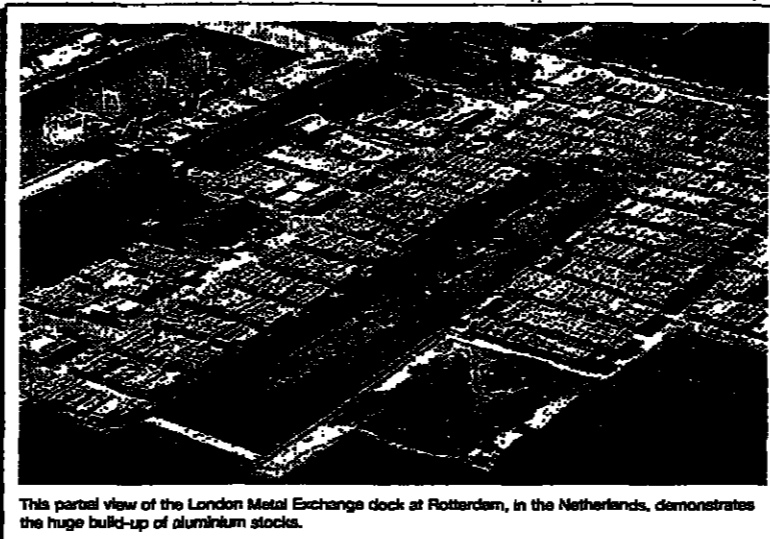
forecast to be 5.04m lbs (2.28m tonnes).

Some analysts suggest that there might even be a shortage of primary smelting capacity in the late 1990s, because nearly every planned smelter project was shelved during the recession. Mr O'Carroll at Reynolds says it would not surprise him if there were one or two years of too little capacity. But aluminium prices would not stay at extraordinarily high levels for very long. Most commentators say that prices of between 75 and 85 cents a lb (\$1,653 and \$1,873 a tonne) would be enough to encourage banks to put up some of the US\$1bn a time needed for new aluminium smelters.

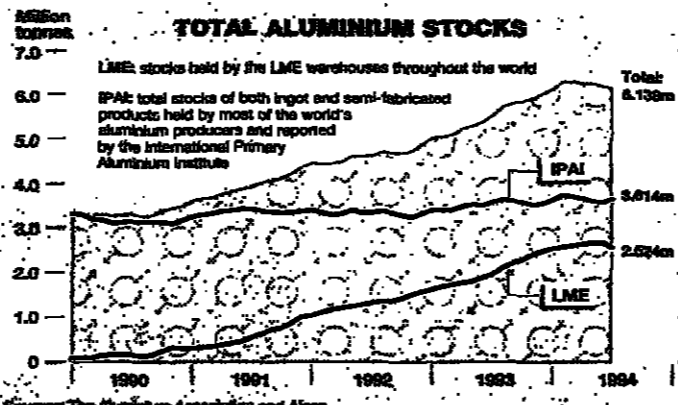
Mr Paul O'Neill, chairman of

the Aluminium Company of America (Alcoa), dismisses the idea that shortages of aluminium and exceptionally high prices will appear. However, he says that by late in 1995 it will be necessary to re-start all the smelting capacity recently shut down.

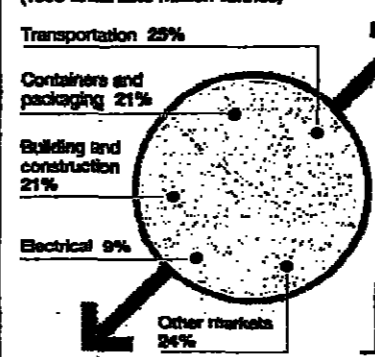
Alcoa drew up forecasts for 13 big aluminium-consuming countries – by no means a world-embracing list – and this showed potential demand for another 8.9m lbs (4.0m tonnes) of aluminium by 2004, equivalent to 25 per cent of last year's primary aluminium. "And," insists Mr O'Neill, "that does not take into account the potentially large increase of aluminium usage in automobiles."



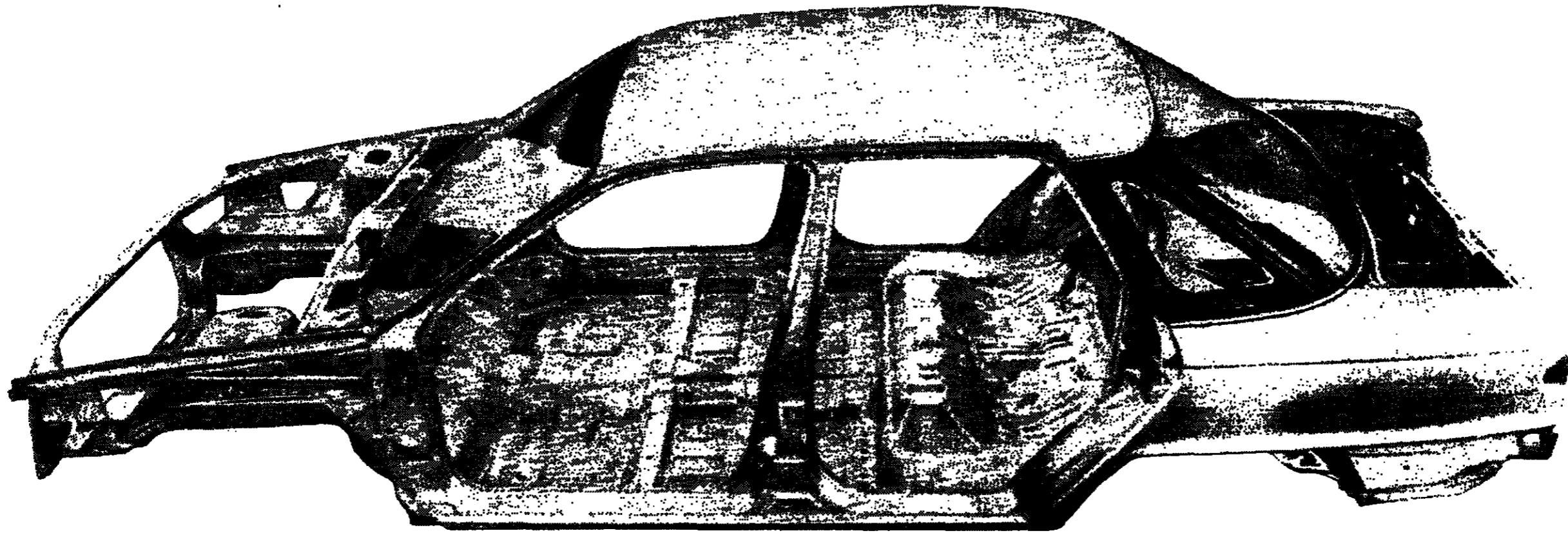
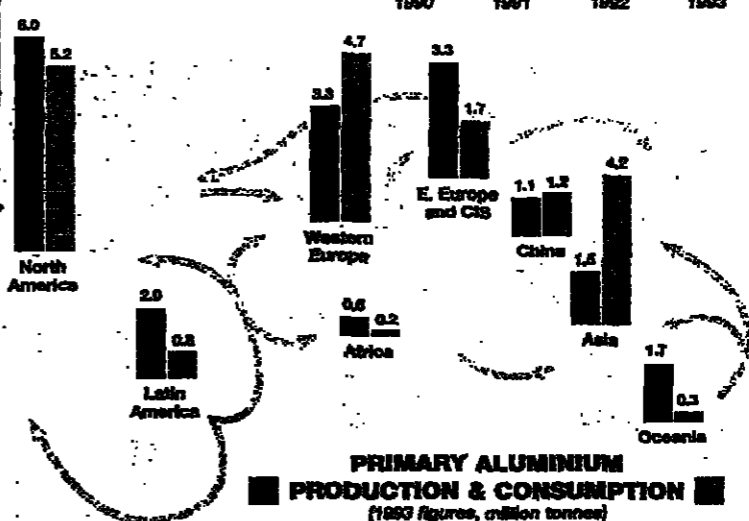
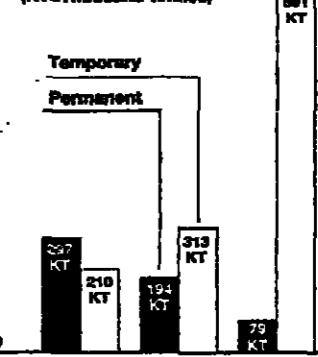
This aerial view of the London Metal Exchange dock at Rotterdam, in the Netherlands, demonstrates the huge build-up of aluminium stocks.



**WESTERN WORLD ALUMINIUM CONSUMPTION**  
(1993 total: 20.6 million tonnes)



**PRODUCTION CUTS ANNOUNCED**  
(KT=Thousand tonnes)



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## ALUMINIUM 2

Western groups see opportunities in Russia, writes Kenneth Gooding

## Statistics gap delays plans

When the mayor of Tursunzade fired several pistol shots at the general manager of Tajikistan's aluminium smelter, the news ricocheted around the global industry. For the Tursunzade smelter is one of the world's biggest, and its output was already falling because of civil war and shortages of raw materials and electricity.

For Mr Mikhail Sinani, the man sent from Russia with a team of technicians to help the Tajiks keep this vital source of foreign earnings up and running, the murder attempt was the last straw.

Even though the smelter is now being protected by Russian paratroopers, Mr Sinani decided not to return to Tajikistan when his holiday in Russia ended recently.

Tursunzade's mayor, Mr Ibrodullah Boymatov, had asked for a large consignment of aluminium for delivery to a foreign trader, but did not have proper documentation. When Mr Sinani refused to provide the metal, the mayor pulled out his pistol. Some local reports suggest that Mr Sinani returned his fire. Fortunately, neither man was hurt but the damage to the future of the smelter - the largest single enterprise in the southernmost former Soviet republic - is incalculable.

Without Russian help the smelter's output, already down to only 252,000 tonnes in 1993 compared with its annual capacity of 500,000 tonnes, is expected to fall steeply - some informed estimates suggest to

only 100,000 tonnes.

Whether the former Soviet Union industry will ever supply more than "informed estimates" remains to be seen. Soviet aluminium production statistics were a state secret for so long that even a reformed Russia seems reluctant to give them.

"Now that Russia is being absorbed into the global aluminium industry, we are desperately trying to get some statistics, some facts, that will let us get on with some proper planning," one senior western executive complained recently. Russia has agreed to supply production and export statistics to the International Primary Aluminium Institute, the London-based organisation which collects data for the western producers. However, the institute is still waiting for the go-ahead by for a fact-finding visit to the Russian smelters to collect necessary background information.

Western executives complain that, since the Russian smelters were privatised, the situation has become even more chaotic. The central authorities have no control - and no statistics - while anyone wanting to do deals with the smelters has no clear idea who to talk to.

The chaos is amply illustrated by the present situation sur-

rounding Krasnoyarsk, Russia's second-largest smelter. Pechiney, Europe's biggest aluminium group, announced in July that it had won Russian government support for a scheme to modernise gradually the Siberian aluminium smelters - Krasnoyarsk, Bratsk and Novokuznetsk - which between them account for about half of Russia's aluminium production capacity, but are among the world's heaviest polluters.

Mr Bernard Legrand, head of Pechiney's aluminium activities, said that a start would be made at Krasnoyarsk with a "module" of 250,000 tonnes of annual capacity to replace outdated existing equipment. Arranging finance for this, an estimated US\$400m to \$500m, and completing detailed engineering studies would take 18 months to two years, and construction another two years.

But at the same time Alcoa, the world's biggest aluminium producer, has been talking to the Krasnoyarsk smelter management. According to local sources, Alcoa wants to join forces with the hydro-electric company that supplies Krasnoyarsk, to take over the entire plant and its production.

Similar ideas are being mulled over by Russian investment companies which, together with

western aluminium producers (Alusuisse is rumoured to be among them), might soon be putting them to the Krasnoyarsk management and the Russian government.

In the meantime, Trans-World Metals, a London-based international trading company which has been the biggest supplier of raw materials to Krasnoyarsk and possibly its biggest customer for aluminium for export, is protecting its commercial interest. Trans-World has organised consortia to acquire large shareholdings, at least one-third, in Krasnoyarsk and three other Russian smelters.

The position of trading houses like Trans-World is less secure following a recent international trade agreement between some of the big aluminium-producing nations which promised funds to help modernise the Russian industry - and reduce its dreadful pollution - if it joined in a worldwide cut in production.

But all this jockeying for position suggests that some western aluminium groups see a unique opportunity to move in to a potentially huge new market. Russia's smelters are being gradually absorbed into the global aluminium industry. The Russian smelters that survive

can also be expected to become more like their western rivals and develop downstream fabricating operations, because Russia eventually will consume more of its own aluminium.

Mr Horst Peters, managing director of VAW Aluminium-Technologie, the German group that is helping the Novokuznetsk smelter to modernise, suggests that this battle for ownership of the smelters is one of the most important issues in Russia today. "It is a question of who will supply the raw materials and who will take the metal in future."

However, in the meantime, says Mr Peters, the physical condition of some of the smelters is deteriorating rapidly. Consequently production will be down by 10 to 15 per cent this year from the 1993 level, not because of the trade agreement but because equipment is breaking and not being repaired. Russian production is therefore likely to be about 2.5m tonnes compared with the industry capacity of about 3.3m.

One third of the former Soviet Union's 3.6m tonnes of aluminium-smelting capacity could be expected to disappear in the next five years, driven out of production by high costs and obsolete equipment, according to Mr Peters.

He pointed out that, if they are to meet present Russian emission standards, Russia's aluminium smelters needed total investment of US\$3.5bn. Money for this purpose was presently not available in the former Soviet Union, nor in the western financial markets, Mr Peters insisted.

So those smelters not worth modernising will be phased out. He suggests that some heavily-polluting smelters could be modernised gradually. This could be financed out of cash flows and some help from international financial institutions or export credits.

Mr Peters insists that the Russian smelters are no longer low-cost producers. They are having to pay world prices for alumina (an intermediate material, and electricity and transport costs have been rising rapidly - including the cost of security to protect the valuable metal on its travels over vast distances. "Some smelters say that, if they paid all their bills they would be bankrupt."

The projected fall in output should have the effect of stabilising Russia's aluminium exports, Mr Peters suggests, because "domestic demand is at rock-bottom." Aluminium sales in Russia, which fell to only 600,000 tonnes in 1993, are now running below an annual rate of 400,000 tonnes. Yet there is demand for aluminium products there - for example, all the aluminium windows needed for the damaged parliament building in Moscow were imported from the west.



Plate material from Hoogovens aluminium rolling mill in Koblenz is used in the production of sides and bottoms for the Ariane-5 rocket, the first prototype of which will be launched early in 1995

The new global deal has cut production. But can it last?

## Next year may see a shortfall as stocks decline

The unprecedented international trade agreement signed in February to encourage aluminium producers to cut production has transformed the market this year. Prices have risen to levels where all producers are making profits, and the huge level of world stocks has started to fall as consumption outstrips production at last.

The fact that western producers sought an international deal to help curb the flood of metal from Russia is a measure of their desperation at the interminable build-up of stocks. By the end of last year, reported stocks totalled almost 4.5m tonnes, with 2.45m tonnes at the London Metal Exchange and just over 2m tonnes at the International Primary Aluminium Institute.

The Memorandum of Understanding (MOU) - signed by Australia, Canada, the European Union, Norway and the US, as well as by Russia - soon started to be reflected in rising prices on the London Aluminium exchange. By July, prices were 50 per cent above the eight-year low of last November - \$1,037 a tonne. The memorandum called for production cuts of up to 2m tonnes, including 500,000 tonnes in the former Soviet Union.

The question now is how long can it be expected to hold together. As Anthony Bird Associates, a UK consultancy, pointed out in its annual review of the industry, there are great difficulties in getting such agreements to work. In addition to the conflict of interest between high- and low-cost producers, and legal problems faced by American and Canadian producers, Bird points out that, when such agreements collapse, "the results can be devastating" - and he cites the 1985 tin crisis.

Bird bases his forecasts on the assumption "that the MOU will be mostly successful for a limited period." Bird, in April, suggested that production and consumption should be roughly in balance this year.

Since then, however, indications are that stocks will fall. Biliton-Rothoven Metals' analysts are looking for a supply deficit of 400,000 tonnes, with Western world output at 14.15m tonnes, net imports at 1.6m tonnes, and consumption at 16.15m tonnes.

Another recent assessment - the Spector Report of the US - put the estimated decline in world stocks at 700,000 tonnes this year, in stark contrast to the 1.5m tonne increase in 1993. However, the real impact is likely to come next year. Bird suggests that supplies should be around 1.4m tonnes below output, while Biliton is predicting a shortfall of 1.15m tonnes.

The prospective fall in stocks is not merely a reflection of production cuts - consumption is growing strongly, and has been remarkably healthy throughout the recession.

"We have little reservation in stating that the underlying demand outlook for aluminium is good, and probably better than for any of the other major base metals, with the possible exception of nickel," says Biliton in its annual Aluminium Market Report. The report points to the underlying growth rate in non-mature economies, particularly south-east Asia, which increased its share of western aluminium consumption from 10.4 per cent to 19.1 per cent between 1979 and 1992. By the end of the decade, the proportion could be almost 25 per cent.

At the same time, aluminium continues to take market share from other metals and materi-

als in the industrialised economies. This is particularly true of the automobile industry. In addition, the packaging sector is continuing to grow spectacularly, and has proved itself impervious to recession. Biliton concludes that "aluminium, mainly in the form of can sheet, will not only continue to dominate the expanding US beverage can market, but will also make increasing inroads in the European and Japanese markets where there remains considerable scope for growth."

However, it warns that much of the growth in packaging and automobile sectors is linked with recycling. "Thus to some extent the growth in primary consumption will be constrained by competition from its own remelted scrap." Nevertheless, Biliton believes an underlying growth rate of between 2.5 and 3 per cent can be achieved to the end of the decade and beyond.

Bird is even more optimistic, predicting growth of 3.4 per cent between 1990 and 2004. It points out that one of the main reasons for the sector's resilience in the recession was the "strikingly competitive position, which we expect to see maintained in the years ahead. But in addition we think the aluminium intensity of any given level of industrial activity has risen."

Ironically, demand for the metal is likely to outstrip production once the stocks overhanging the market have been drawn down, which will probably take only three years.

Bird points out that there has been an investment famine in the west, because of the short-term excess of supply. As the rate of capacity utilisation is already above 90 per cent, "it would not take much of a supply correction to bring the industry back to the point where new capacity was needed very urgently."

The only big project due to come on stream before the end of 1995 is the Alusaf smelter in South Africa. However, Spector believes that, in order to meet demand in 1997 and 1998, the industry needs a further 1.5m and 2.6m tonnes respectively of new capacity, "and that's just not on the cards at the moment."

Observers wonder if the Russians will be able to make up the shortfall. Bird argues that there will be further falls in exports from the former Soviet Union, not because of the MOU, but because of cost constraints.

In the west, production costs have been falling to an average of \$1,135 a tonne. Russian costs are already higher at \$1,234 a tonne - a level at which they can now make money. However, hyperinflation in the former Soviet Union is clearly evident when comparing the costs in 1990, which were only 3 per cent of the western world average. Bird thinks the Russians will "price themselves out of western markets as a result of this cost explosion."

Paradoxically, the MOU, and the consequent rise in market prices, has taken some of the short-term pressure off the Russians. At the end of August, Spector suggested that Russian exports had already peaked, and that they could be down by as much as 100,000 tonnes a month for the last five months of this year.

Taking all the indications together, it looks as though the remainder of the decade will prove an exciting time for the industry, with strong growth and a need for expansion. As Spector puts it: "The fundamentals look great and are getting better."

David Blackwell

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**O**n the face of it, you would not expect Mr Leslie Boyd to speak favourably about aluminium beverage cans.

As a Scot who worked for British Steel Corporation before moving to Highveld Steel in South Africa some 25 years ago, he would seem an unlikely advocate of this particular form of packaging which has made a big dent in demand for steel, at least in one market sector. Yet he speaks enthusiastically about aluminium beverage cans "taking over all over the world". Steel cans can't compete, he suggests, because the aluminium variety lend themselves much more to recycling.

Today, Mr Boyd is a director of the Anglo American Corporation of South Africa and chairman of its industrial group, which now has a vested interest in the development of aluminium beverage cans in that country. Highveld's Rheem division started up a new aluminium can plant last year, which exceeded rated capacity almost from day one, and is expected to make a big contribution to Highveld's earnings in 1994.

Mr Boyd already is suggesting that Anglo's next big capital investment in South Africa might be a US\$1.5bn aluminium can sheet plant to provide raw material for can-making.

Significantly, given his views on the subject, aluminium can recycling in South

Kenneth Gooding on the implications of aluminium beverage cans' success in the US

## The industry plays its Green card

Africa, which started only nine months ago, has already reached 20 per cent - a level not yet reached in many more mature markets, and one that the rest of the global industry finds heartening.

For, in the past 30 years, aluminium beverage cans have elbowed out the steel variety and taken virtually 100 per cent of the US canned beers and fizzy drinks market. The industry, dominated by a handful of large groups operating globally, is now taking lessons learned in the US to other markets the world over.

In the US, some 65bn cans of beer or fizzy soft drinks are consumed every year - an aluminium can a day for every man, woman and child - and output outstrips even the production of nails and paper clips.

Aluminium beverage can-makers exercise the same attention and precision as do makers of the metal for an aircraft wing, using the highest-powered computers to design containers that can withstand three times as much pressure as there is in a

car tyre and also support 250lbs in weight. Careful design has enabled the industry to cut the amount of metal needed to produce aluminium cans. Today's can weighs about 0.48 of an ounce, down from about 0.66 of an ounce in the 1960s, yet producers expect to reduce that by another 20 per cent.

The success of the aluminium beverage can has left the aluminium industry with a problem: about 10 per cent of global demand for its metal comes from one product in one country. So it is spending heavily to spread the "gospel" of the aluminium beverage can around the world.

To promote the use of aluminium beverage cans outside the US, the industry leans heavily in its "green" credentials, claiming that aluminium cans may be recycled on a "closed loop" system (from cans to scrap and back to cans again in only a few weeks). The relatively high value of aluminium - aluminium cans are worth six to 20 times more than any other used packaging material, and are the most valuable used package found in household waste -

enables the industry to spread the word that can recycling gives collectors a decent income.

Last year, for example, the US industry is estimated to have paid out about \$900m for used cans, money that went back into local economies to benefit individuals, schools, churches/scout troops and other local organisations.

**H**owever, this is not simply altruism on the industry's part - it needs this recycled metal, because it is cheap. As much as 95 per cent of the energy needed to produce new aluminium is saved by recycling old metal, because aluminium "stores" energy. This is important, because the average smelter uses as much power as a town of 500,000 people to produce new aluminium. On top of that, there are capital savings because a remelting plant costs only one-tenth as much as a smelter.

Steel producers point out that the high cost of new aluminium means it only

makes economic sense to use aluminium cans if more than 60 per cent of them are recycled. Not many markets achieve this level. The US recycling rate of about 66 per cent means that last year roughly 600,000 tonnes of aluminium, worth about \$900m, escaped from the system, possibly to be thrown away.

In the US, recycling of used beverage cans (known in the jargon as UBCs) is facilitated through more than 10,000 recycling centres. There is no shortage of recycling infrastructure in Europe either. British Alcan in 1991 opened a £28m remelt plant dedicated to UBCs at Warrington in the UK; and others are operated by Granges in Sweden, VAW in Germany, Elval in Greece, Alcan and Reynolds Metals in Italy, and Pechiney in France. Together they have an annual capacity of 120,000 tonnes, helping to turn old beverage cans into new ones. There are also many secondary smelters throughout Europe remelting UBCs into new ingots for other high-quality aluminium products.

In Europe, several aluminium companies are financially backing an organisation which promotes aluminium can recycling. Acre (Aluminium Can Recycling Europe). Acre helped South Africa's equivalent organisation prepare the groundwork for that country's roaring start to aluminium can recycling.

According to Acre, Europeans worked their way through 56,050 tonnes of aluminium beverage cans last year, up from 39,595 in 1992; and at least 29 per cent were recycled, up from 26 per cent.

Mr Richard Holder, chairman of Reynolds Metals of the US, now one of the world's biggest aluminium can producers, says the industry can expect growth in the US to come by taking share from glass and plastic containers for products other than beverages. "Outside the US there are wonderful opportunities," he suggests.

Reynolds built its first aluminium can plant with local partners in Brazil in 1988. It has been expanded three times, and a second plant is under construction. The Brazilian company is also constructing plants in Argentina and Chile. Mr Holder says: "When we've finished we'll have the capacity to make 5bn cans a year - but that's only 5 to 6 per cent of the market. So if growth trends follow the US pattern, the market opportunities are obvious for many years."

The motor industry has joined producers in voicing optimism about the metal's future

## Ford and Audi make light of motoring

Mr Jacques Bougie, president of Alcan, the world's second largest aluminium group, let me borrow his car last month. He was prepared to do so because the car is significantly different - it is one of the first 40 "aluminium intensive vehicles" (AIVs) built by Ford.

This fleet is based on the Mercury/Sable range, and gives the first clear indication that aluminium is suitable for the production of high volume, rather than just low volume "niche" cars.

Ford, the world's second largest automotive group, and Alcan believe they have overcome most of the problems associated with producing aluminium cars from an infrastructure which was set up to make them from steel.

Ford still needs to conduct extensive manufacturing trials and consumer tests on the new AIV, and Mr Bougie's car is part of that programme. My half-hour drive from downtown Montreal to Dorval airport and back did not give much scope for serious testing. But back in May the AIV was given a much more gruelling try-out when four of the cars were taken to the Saint Eustache race track, near Montreal, to be put through their paces by some automotive writers and professional drivers. The drivers were also provided with equivalent steel-bodied cars - 400lbs or 47 per cent heavier than the AIVs - to compare performances.

After this test, Mr Jack Heebler, of Automotive News, reported: "This car [the AIV]

handles so well it's as if it has sticky tyres to help it hold the road. The AIV actually seems to carve through the turn without the heavy feeling of the steel-bodied car."

Similar favourable reviews greeted the Audi A8, the first production car to use aluminium as its primary structural material. This was good news for executives at the Aluminium Company of America (Alcoa) and at Audi who have spent the past 12 years in a co-operative research effort, and have invested a great deal in the project. Audi has spent about DM1bn (\$650m) to bring the new luxury A8 to market, and Alcoa has spent \$70m for a plant at Soest, in Germany, where it is producing space frame components which it also hopes to sell to other car makers.

Alcoa and Audi took a different route from Ford and Alcan. As aluminium is initially much more expensive than steel, they believed it would be too expensive simply to substitute aluminium components for those traditionally made of steel. Instead, they designed a car that has many fewer individual components and structures than are used in a steel vehicle. They developed a space frame, a skeleton-like body structure, composed of fewer than 100 extrusions and castings, compared with as many as 300 for a stamped steel body. Like Ford and Alcan, Alcoa and Audi had to develop new manufacturing processes to produce these space frames, and new aluminium alloys were also developed.

All this activity has been prompted by increasingly stringent regulations covering both car fuel economy and emissions. This is a global trend, but is strongest in developed markets such as the US, western Europe and Japan. Both requirements can be met by lighter vehicles. And, as customers are resisting any attempts to make cars much smaller, designers are focusing on lighter materials to replace steel and plastics. Aluminium used in a typical US car has grown from 50lbs in the 1960s to nearly 200lbs today. Most of that extra aluminium has been used in components once made of steel or cast iron.

There is still growth to come from this substitution process. Alcan's Mr Bougie says that demand growth of about 6.5 per cent a year can be expected for such things as castings, forgings and some aluminium sheet for cars, from today's starting point of 4m tonnes.

However, now "both Alcan and Alcoa have demonstrated the use of aluminium in car structures, this gives us growth potential for another 20 years. But the big growth does not come until after the year 2000. Aluminium structures in high volume models do not come until 2000 to 2005."

At present, the Audi-Alcoa technology is not economically viable for cars produced at a rate of more than 100,000 a year. Mr Bougie points out that Alcan's technology was from the start aimed at high-volume production of mid-sized cars. "It is in the

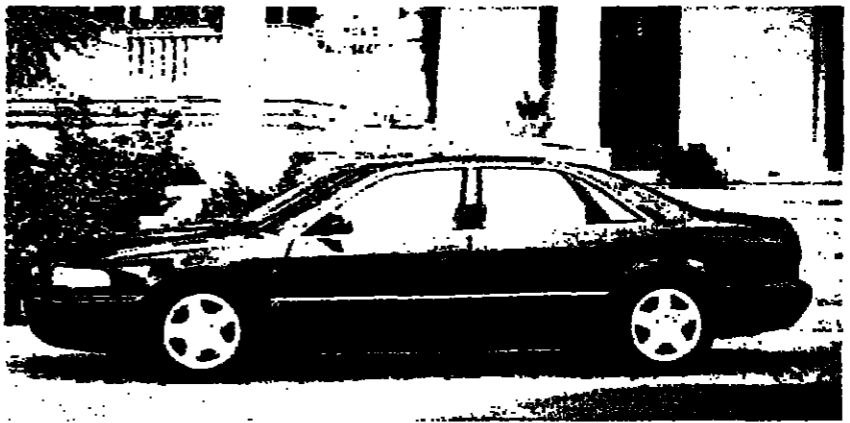
mass-produced models that the real volume market lies, a market we should see developing over the next five to ten years."

Mr Donald Macmillan, vice-president and general manager (automotive) for Alcan Rolled Products, whose job puts him face to face with the US car companies in Detroit, says the automotive groups are preparing themselves for even tighter regulations, and that, in order to achieve those new standards, they will need to hit higher miles per gallon figures with high-volume, mainstream vehicles.

When a car is designed specifically to be made of aluminium, secondary weight savings can be incorporated - a lighter body means that engines can be smaller, braking systems do not have to be so powerful, and so on.

There are still some question-marks over the use of aluminium in cars - questions about aluminium's reparability and its cost. A recent Massachusetts Institute of Technology study showed that car-makers were having to spend an extra \$1.50 a car for every lb saved - not particularly welcomed by an industry that likes pinching its pennies.

The motor industry is also worried about the volatility of aluminium prices. Both Alcoa's chairman, Mr Paul O'Neill, and Mr Macmillan, of Alcan, insist, however, that "life of car" stable prices can be offered as long as these reflect the cost of replacing the smelters used to produce the metal.



The Audi A8 was the first production car to use aluminium as its primary structural material

The North American groups are not the only ones likely to share in the potential bonanza. Hydro Aluminium, part of Norsk Hydro, Norway's biggest industrial group and Europe's biggest producer of aluminium extrusions, has a vested interest in the success of the space-frame concept, which could be a big user of extrusions. Hydro has been successfully co-operating on car space-frame concepts since the mid 1980s with various groups, including Renault in France, Porsche in Germany and Pininfarina in Italy.

Anusuisse-Lonza, of Switzerland, has a virtual monopoly in the supply of aluminium sheet for the car industry in Europe, because it has developed and patented an alloy that other companies prefer to use under licence rather than develop an equivalent material.

There is still a possibility that the avalanche of new business that the aluminium

industry hopes for from the motor industry will not materialise, and executives remain cautious about some of the more extravagant forecasts being made. The steel and plastics producers are working hard to ensure their car business is not further eroded. Already a lightweight cast iron for automotive components available is available from Sintercast, a Michigan-based, Swedish-American company.

Nevertheless, Alcan's Mr Bougie can say confidently: "By the year 2010, the world automotive industry could be consuming as much as three times the aluminium it does today. The additional shipments to this market alone could require the equivalent of the output of 30 to 40 additional world-scale aluminium smelters, although by that time a growing part of this would come from recycled aluminium."

Kenneth Gooding

# TIME MACHINE

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## ALUMINIUM 4

Richard Mooney discusses the importance to aluminium of the London Metal Exchange

## Lower production cuts the stockpile

Aluminium has clearly been the London Metal Exchange's outstanding performer this year.

At 49 per cent, its price rise since the end of 1993 beats copper into second place by 13 percentage points, and while it still has to play second fiddle to that contract in terms of turnover, it has narrowed the gap appreciably with a 48.5 per cent rise to 10.67m lots in the January-September period, compared with copper's 11.5 per cent rise to 12.2m lots.

A less welcome distinction is aluminium's continuing unsalable lead in the LME warehouse stocks league. Although down by 460,000 tonnes from June's all-time high, the total, at 2.19m tonnes, is still nearly double that for zinc, which is itself well clear of lead and copper in the minor placings.

That the size of the stockpile has been a millstone around the neck of the aluminium market as it has striven to lead the base-metals sector out of recession is beyond doubt. But it has become a less onerous burden of late, as concerted efforts by aluminium producers around the world to reduce excess production have led to a quickening drawdown from this over-hanging reserve of metal.

From the LME's point of view, moreover, the size of the stockpile pays a compliment to the success of the aluminium contract since its launch in 1978.

"The LME is now performing, with great ease and enthusiasm, the inventory financing job that was once done for con-

**The stockpile is a compliment to the success of the aluminium contract**

sumers and producers by their own individual banks," Mr Ted Arnold, Metals Analyst at Merrill Lynch, told a Metal Bulletin-sponsored conference in London this year. He said it was estimated that between 55 and 60 per cent of surplus aluminium stocks in the western world were now held on the LME, compared with only 14 per cent 12 years ago.

Facilitating this development, Mr Arnold said, had been a change in the LME's membership structure. There were now far more banks and financial-services institutions, which had "easy access to large amounts of money".

He quoted a survey produced by Alan Heap, of County NatWest Securities Australia, which showed that up to 80 per cent of all LME stocks were now held by financial institutions, rather than by "traditional" users of the physical market, such as producers, merchants and consumers.

But the development of a highly liquid LME aluminium contract has also altered the commercial behaviour of some producers of the metal, suggests Alan Alcan. In a recent issue of *Compass*, its house journal, the Canadian producer said that before they had the LME as a "buyer of last resort" producers worldwide had been "quicker to

adjust their production to market needs.

"But today, things are quite different. New types of producers have entered the market over the past ten years - if they can't find clients for their metal, they simply sell it to the LME and receive cash."

Alcan also noted that it was mainly speculators who owned the aluminium in LME warehouses.

"These investors have nothing to do with the aluminium industry," it pointed out. "For them, buying and selling aluminium is strictly an investment decision."

Alcan is not alone in warn-

ing of the impact of the new breed of investors involved in LME trading. Buying by investment funds and banks had increased metal prices, and the volumes traded and sometimes caused prices to anticipate improvements in the fundamental supply-demand balance.

County NatWest's Alan Heap told an LME seminar during London Metals Week earlier this month. But "later in the cycle short selling by non-trade players may push prices lower than many market watchers would expect".

The threat was not immediate, however. Banks held metal

in LME warehouses as collateral against loans, and also as a revenue-earning investment - so it was not available for immediate delivery. About half the LME stockpile was tied up as collateral, Mr Heap estimated.

This "financialisation" of LME stocks was part of the explanation as to how "physical tightness" could drive aluminium prices higher at a time of "statistical surplus", according to US industry analyst Stewart Spector. In addition, there were "logistical problems" limiting how quickly metal not tied up in financing programmes could be shipped from the LME warehouses around the world. Mr Spector pointed out in the latest issue of his *Monthly Aluminium Statistical Review*.

All this suggests that, while the market effect of the LME stockpile is not so heavy as it may at first appear, it is likely to last longer than producers

would hope. At Rotterdam, where the amount of LME aluminium ingot awaiting shipment was estimated at 400,000 tonnes, and rising "almost daily", port facilities were capable of loading no more than 60,000 tonnes a week and more probably somewhere between 30,000 and 40,000

**The newly-merged New York exchanges hope to have a new aluminium contract in 1995**

tonnes, said the Spector review. "At that rate, it could take well into 1995 to empty Rotterdam warehouses."

LME dominance of the world aluminium market could be facing a challenge soon, but not so soon as had been expected.

The newly-merged New York Mercantile Exchange (Nymex) and New York Commodity

Exchange (Comex) had planned to have a new aluminium contract up and running early in 1995, but Nymex chairman Daniel Rappaport admitted recently that that target was "overly optimistic". "But there is still a chance for the end of 1995," he added.

One problem, he said, was designing a contract with specifications that met the market's needs. Another was properly integrating it with the LME's established contract.

"The Comex and LME contracts now feed on each other," Mr Rappaport told the Reuters news agency, adding that Nymex's aim would be to create a similar "symbiosis" with the aluminium contract.

He noted that LME chairman Raj Bagri had told him that there was not room for two aluminium contracts. "But he invited us to find that out for ourselves," the Nymex chief added.

One leading US producer, Kaiser Aluminum Corporation, seems to agree with Mr Bagri. "Right now the LME has many delivery locations in the US, and it seems to be working efficiently," said a company executive earlier this year. "I don't see the need for another contract to get our business done."

Kenneth Gooding looks at other recent developments

## As value rises, so does theft

The downside to aluminium's high value and recyclability is that it is all too frequently the target for thieves.

When prices rise, aluminium beer barrels, road signs and bridge rails - often cut through by power saws - disappear at a growing rate.

This represents a real loss for the industry, because these products are usually made from high-quality alloys which would normally be recycled as such. But, after thieves have melted down these products, the alloy is not immediately recognisable, and the metal is sold as the lowest-priced scrap.

More important, customers - particularly local authorities - are forced to consider giving up using aluminium and changing to less-tempting materials, even if those materials do not perform as well as aluminium.

## Ways to recycle foil

Already as much as 70 per cent of the aluminium used in electrical engineering, building and transport is re-used. Aluminium automotive castings are almost entirely made from scrap metal.

The industry is now turning its attention to recycling aluminium foil - a tricky business, because a great deal of bulk has to be collected to get any reasonable weight, and 90 per cent of foil is meant to be in contact with food which creates hygiene problems.

In the US, Reynolds Metals, the second-largest aluminium group, began testing foil recycl-

ing in 1991. Mr Jeremiah Sheehan, Reynolds' president, admits that it is not as commercially necessary for the industry to recycle foil as beverage cans - in the US only 200m lbs (90,700 tonnes) of aluminium is used annually for consumer foil, plus a similar quantity for food and other containers, compared with 4bn lbs (1.8m tonnes) used for cans.

"But recycling helps to identify foil as a green product," he points out. "It gives foil an edge over plastics."

In the UK, nearly 40 per cent of aluminium used in packaging (including beverage cans) goes into foil and about 50,000 tonnes of aluminium foil packaging, worth roughly £15m, is thrown away every year.

To recapture at least some of this, an Aluminium Foil Recycling Campaign (AFRC) was started by foil converters Alcan Elco Packaging, Howat Foil and Paper Products, and William Garfield, all members of the Aluminium Foil Container Manufacturers Association, with British Alcan Consumer Products.

AFRC spent £200,000 over two years on five pilot schemes, from which it became obvious that foil would not be collected successfully by local authorities working alone, without help from the industry. So the industry has drawn up a 10-year plan which will establish national infrastructure and work towards a 30 per cent recycling target.

Typically, schemes provide local authority "foil bank" systems serviced by a single local charity or group of charities. Banks are located on supermarket or other prime sites.

AFRC says the involvement of a local charity provides motivation for the public to give for their own community - clean foil can fetch £350 a tonne. Schools are also involved in the collection schemes. The scheme is funded by a voluntary levy of £10 a tonne from the rolling mills.

## Educating industry

Aluminium is a relative newcomer compared with other metals, and manufacturing industry in general remains woefully ignorant about its uses.

The European aluminium industry is intended to rectify this with a £1.5m (€1m) project aimed at educational institutions and industries that use the metal.

Under a European Commission programme known as Comett II, aluminium industries in nine EC and European Free Trade Association countries and 25 universities are setting out to put aluminium on the educational map.

The EC is providing about one third of the £1m (£600,000) cost, while the universities are contributing their time. The industry is footing the rest of the bill, mainly through the UK's Aluminium Federation, Germany's Aluminium-Zentrale and Scandinavia's Aluminium in the Nordic countries.

The Aluminium Training Partnership (ATP) provides the link between the industry and the universities.

The second, and most important project, is known as Talat, an acronym for Training for Aluminium Application Technologies.

Its objective is to produce 150 hours of teaching material covering a broad range of engineering disciplines: material property information on engineering alloys and products; design and calculation of aluminium alloy structures; manufacturing of products; joining techniques and surface technology.

For each subject, one or more groups of university partners

have been formed, each with specialist contacts in the industry. They aim to produce lectures suitable for courses in nearly all the relevant areas of technical education.

In the UK, the Department of Trade and Industry has promised £120,000 over three years, if the industry will match that pound for pound, for teaching material such as lecture notes and formatted computer disks.

## Gencor's act of faith

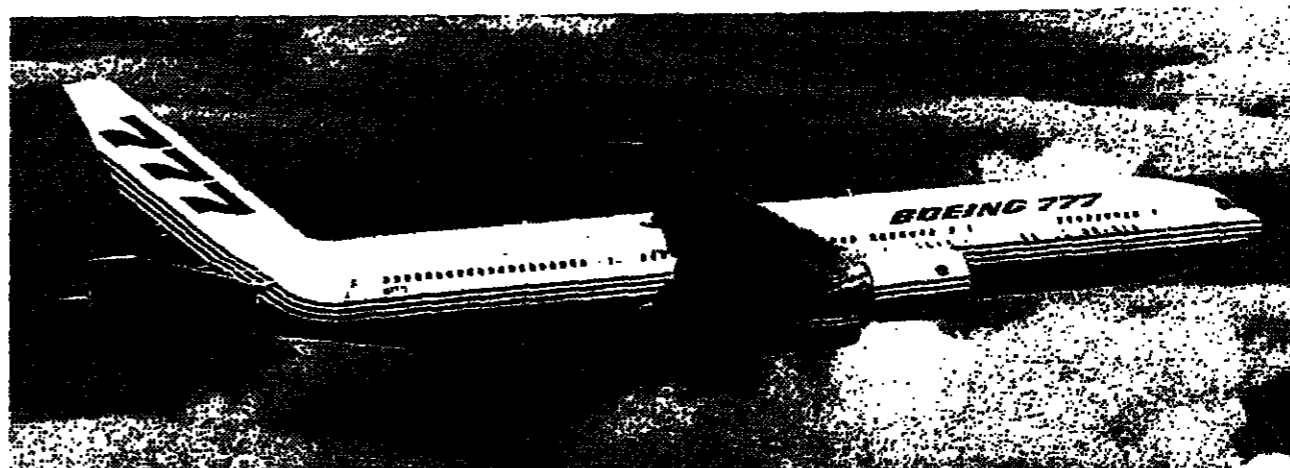
No company has more faith in the future of aluminium than Gencor, the South African resources group, which in July paid \$1.1bn for most of the Royal Dutch/Shell group's mining and minerals assets. These operate mainly under the Billiton banner.

About 60 per cent of Billiton's revenues come from its interests in bauxite and alumina, the raw material and intermediate product needed for aluminium production. These interests are located in Australia, where Billiton has 30 per cent of the big Worsley deposit, Brazil and Ireland.

Gencor also has a 41 per cent interest in Alusaf, the South African aluminium producer that is completing a \$2bn expansion to increase its annual capacity to 640,000 tonnes, a size not seen outside Russia before.

Mr Brian Gilbertson, Gencor's chairman, points out that a combination of Alusaf and the Billiton upstream bauxite and alumina operations would produce the fifth-largest integrated aluminium business in the world. Gencor has in mind floating Billiton or part of the aluminium assets on a stock exchange at some stage.

Mr Gilbertson admits that when aluminium prices are low the Billiton deal has little appeal. However, "at high prices the returns are huge. If our estimate of the medium-term [aluminium] price trends are anywhere near correct, then this parcel of assets will prove to be very valuable and the price we have paid to have been cheap."



## A metal and some of its applications

Top: Nearly 75 per cent of the structural components of the new Boeing 777 wide-bodied commercial transport aircraft are of aluminium. It is scheduled for full-scale production next year.

Upper left: As a packaging material, aluminium has a number of advantages. It is light, air- and moisture-proof, safe and hygienic for medicines, heat-resistant and excellent to print on.

Above: Miguel Indurain won the 1994 Tour de France on a bicycle made of Duralcan, an aluminium-based metal-ceramic material. Thirty competitors used such bicycles.

Left: During the summer, the Feyenoord football stadium, in Rotterdam, was given an aluminium roof covering.

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**ALUMINIUM CAN RECYCLING AND 'PRODUCER RESPONSIBILITY' ARE SYNONYMOUS**

Indeed 'producer responsibility' will not be a new experience for the aluminium industry which had not waited for the Department of the Environment and the Department of Trade and Industry to lay down their joint challenge to the packaging chain in 1993.

Years of research and development work have resulted in advances in source reduction, light weighting, reduction in energy use and development of successful recycling systems.

In 1989, the five\* major aluminium can sheet producers founded the **Aluminium Can Recycling Association (ACRA)** to promote the many benefits of aluminium drinks can recycling (environmental and fund raising) to develop UK collection infrastructure, to assist in establishing numerous grass-roots collection projects

and to increase the recycling rate. Indeed since 1989, the UK aluminium can recycling rate has grown steadily from 2% to an estimated 21% in 1993 and ACRA's own milestone, regardless of any legislated targets, of 50% recycling rate, is within its sights for the end of the decade.

The good news is that the aluminium industry's acceptance of its 'producer responsibility' has worked out very well for the 5\* can sheet producers. There is every reason to believe therefore, that 'Producer Responsibility' will prove to be every bit as beneficial for PRG's 28 companies and for Mr Gummer and Mr Heseltine too!

For assistance with your involvement in aluminium can recycling, please call ACRA on 021-633 4656, facsimile 021-633 4699.

\*Alcan, Alcoa, Pechiney, Reynolds and VAW.

**alu**